TEACHING AGRICULTURE
IN
THE MULTIPURPOSE SECONDARY SCHOOL

588

PREPARED BY
THE OHIO STATE UNIVERSITY EDUCATION TEAM
TECHNICAL COOPERATION MISSION

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DIRECTORATE OF EXTENSION PROGRAMMES FOR SECONDARY EDUCATION
MINISTRY OF EDUCATION, GOVERNMENT OF INDIA
3/17, ASAF ALI ROAD, NEW DELHI
1960

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FOREWORD

One of the most significant developments in secondary education in the post-Independence years has been the growth of the multipurpose school. This was one of the major recommendations of the Secondary Education Commission designed to wean secondary education from an all too unilateral and academic pattern to a system that would cater to the varying abilities and aptitudes of the secondary school pupil.

The multipurpose school as it has emerged has been offering one or more of the seven diversified courses: Humanities, Science, Technology, Commerce, Agriculture, Fine Arts and Home Science. The working of this system has however, brought up numerous problems - lack of suitably trained teachers, lack of suitable books etc. Perhaps the most urgent of these was the lack of suitable books for teachers as well as students. This was true of all the streams and especially of the practical streams such as, Agriculture, Home Science, Commerce and Technology.

The former All India Council for Secondary Education had held seminars, workshops and training courses to reorient teachers, headmasters and education officers in the new philosophy. Several such programmes had been organised for teachers of Agriculture and out of these meetings had come a persistent demand for good teaching material for the use of the agriculture teacher. In response to this demand, the Directorate of Extension Programmes for Secondary Education arranged for a working group of selected teachers of

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To prepare common instructional material for teachers of any subject working in the various States in the country is no easy task. There is diversity from state to state in the curriculum, in the organisational set up, in the emphasis on particular subjects, in the duration of higher secondary courses and in the needs of the communities. Moreover, no such work had so far been done on the problems of teaching agriculture at the secondary school level and the task therefore involved breaking new and fresh ground. As both curricula and syllabi are prescribed by individual states, no effort has been made in this hand-book to make recommendation in these areas. Within a state, teachers can do much to meet the needs of their local communities by varying the degree of emphasis which they place on the subject.

This hand-book, therefore, deals with such topics as principles, objectives, accommodation, furnishing and equipment, audio-visual instructional aids, preparation of lesson plans and co-curricular activities for teachers of agriculture. It also seeks to suggest methods of teaching the subject in the multipurpose school.

The Directorate is grateful to the Ohio State University Team for having helped in producing this book and particularly to Dr. E.R. Towers, Chief of party of the Team for organising and directing the work and editing the book and to Mr. M.K. Luther, Consultant in Agriculture, for the able guidance which he gave to the working group in preparing the hand-book. We hope the book will provide a source of constant and useful reference to agriculture teachers of our multipurpose schools.

NEW DELHI
23, DECEMBER, 1960.

T.K.N. MENON
DIRECTOR

CONTENTS

PAGE

INTRODUCTION

CHAPTER I OBJECTIVES OF AGRICULTURAL EDUCATION 1

CHAPTER II THE TEACHER 8

CHAPTER III ORGANIZATION OF STREAM 18

CHAPTER IV JOB ANALYSIS OF AN AGRICULTURAL ENTERPRISE 31

CHAPTER V THE COURSE OF STUDY 41

CHAPTER VI TEACHING GUIDES FOR AGRICULTURE METHODS AND TECHNIQUES 50

CHAPTER VII TEACHING GUIDES FOR AGRICULTURE LESSON PLANS 72

CHAPTER VIII EVALUATION 92

CHAPTER IX ARE YOU PREPARED 107

CHAPTER X FACILITIES FOR AGRICULTURAL EDUCATION 110

CHAPTER XI CO-CURRICULAR ACTIVITIES 128

GLOSSARY 139

BIBLIOGRAPHY 146

INTRODUCTION

More than three fourths of the people of India depend on agriculture for their existence. It is the mother of all industries and the backbone of the entire economic life of India. It is the source from which the nation gets its food supply and the state a large share of its revenue. Much of the culture, social order and economic life are centred in the Indian village and it is imperative that the farmer, like the surgeon or the engineer, should receive proper training for his occupation.

The need of agricultural education has been felt for some time, and its importance was especially emphasized by the Secondary Education Commission (1953). The older concept of farming as a simple process of turning the soil has now changed, and it is now accepted as a science, a craft and a business of highly complex nature. It is essential not only to educate the farm youth of our country in the role that agriculture plays in the national economy, but also train them in successful control of their farm environment.

In view of its basic importance, the claim of agriculture in the secondary school curriculum has come to be accepted and agricultural education is now being provided in our multipurpose secondary schools. This education should be deep enough to enable man to produce more food for his country and is the first step in the diffusion of agricultural knowledge to the masses.

The ultimate success of this stream rests with the agricultural teacher who is equipped with the knowledge and skills of agriculture but perhaps has had little opportunity to learn pedagogy and how to pass on his knowledge and skills to the students. This handbook is intended to fulfill this need and to be of real help especially to those who are actually teaching agriculture at the secondary level. It is designed to serve as a guide to the agriculture teacher in his varied duties, and to constitute a unit which will help him in many of the problems of organization and conduct of the stream. Its greatest value will be found if it is used as a reference to deal with problems as they arise. The authors sincerely hope that the agricultural teacher will find much benefit in the study and use of this book.

CHAPTER I

OBJECTIVES OF AGRICULTURAL EDUCATION

The term "objectives" was taken from the military during the first World War. It referred specifically to the place to which, and the purpose for which, the movement of the army was being effected. The word has been taken into educational terminology and conveys a similar meaning. By objective is meant the end aimed at, a goal one has to reach and a determiner of action. Objectives should be attainable, for it is frustrating to have an objective with cannot be reached.

You as a teacher must work out your objectives prior to starting any job or lesson. You are a producer and as a producer must know what you expect to produce. Your materials are your students and the final product should therefore be the knowledge, abilities and attitudes which your students have attained from your teaching. Your object is to bring about desirable changes in the learner's behaviour. There will be changes in knowing behaviour, feeling behaviour and doing behaviour, in a combination of the three. These changes in behaviour should be the result of specific, justifiable and attainable objectives.

Characteristics of Good Teaching Objectives[1]

1. Objectives should be stated in terms of life activities.
2. Objectives should be clear and definite in statement.
3. Objectives should be stated in sufficient detail to serve as a basis for the selection of subject matter for instruction.
4. Objectives should be attainable within the time and facilities available.
5. Each teaching objective should imply a corresponding learner's goal.
6. Each objective should represent a change to be brought about in learner's behaviour.
7. Each objective when reached, should contribute to the achievement of the aims of vocational and general education.
8. Specific lesson objectives should be derived from the larger objectives.

Objectives of Vocational Agriculture

The major objective is to train individuals to attain proficiency in farming. The supplementary objectives for vocational agriculture are

1. to maintain a farm family and to create a favourable home environment;

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[1] Hammonds Carsie, Teaching Agriculture, New York, Mc. Grawhill BookCo. Inc., New York, 1950 p 54-55.

2. to manage and maintain farm business efficiently. For this certain abilities, skills, knowledges and attitudes are needed such as

   (a) the appreciation of the importance of scientific farming;

   (b) the selection of land for a crop and a crop for a land;

   (c) growing crops efficiently;

   (d) the use of improved varieties of seeds, implements and fertilizers to the greatest advantage;

   (e) the control of insect-pests and plant diseases;

   (f) storage and preservation of farm products;

   (g) efficient management of livestock;

   (h) economic purchase of raw materials;

   (i) maintenance of farm accounts accurately;

   (j) maintenance of good social relationship in the community; and

   (k) leadership of the community.

Objectives for Agricultural College Preparation

The major objective is to impart sufficient background knowledge of agriculture so that the individual may be prepared for studies in an agricultural college. The supplementary objectives preparatory to extended education are

1. to develop the knowledge and use of different branches of science and mathematics, and
2. to achieve the ability and knowledge needed for both theoretical and practical agriculture.

Objectives of General Agricultural Education

The major objective is the same as the general aims of all secondary education, namely, to lead to an enriched community, home and personal life. The supplementary objectives are:

1. to arouse interest in agriculture among the students,
2. to inculcate a respect for the dignity of labour,
3. to develop aesthetic sense,
4. to develop interest in village development,
5. to make students enjoy rural, social and recreational life,
6. to gather more and more agricultural knowledge and assist rural people in its use and
7. to attain qualities of leadership.

Specific Objectives

The foregoing are the over-all aims of agricultural education. The teacher should now develop from these the specific measurable objectives for each lesson. The following are examples of the specific objectives of four different lessons which a teacher might plan for his student:

1. Lesson topic: Preparation and Culture of Nursery Vegetable Seedlings.

Specific objectives

(a) to give the student an understanding of the germination of seeds, their requirements and their propagation,

(b) to develop his skill, knowledge and ability in the preparation of different types of nurseries,

(e) to develop his ability and skill in sowing seeds and raising seedlings.

2. Lesson topic: Artificial Incubation of Chicks.

Specific objectives

(a) to develop in students an appreciation of the advantages of incubating chicks artificially,

(b) to give them an understanding of the proper use of heat and moisture needed for incubation,

(c) to develop skill in manipulation of the incubator,

(d) to develop students' ability and skill in testing egg for fertility.

3. Lesson topic: Dairy Cattle Feeding

Specific Objectives

(a) to develop in the student an understanding of a balanced diet

(b) to develop his skill and ability to grow and utilize different kinds of dairy feeds economically,

(c) to develop skill and abilities in the student for feeding his cattle,

(d) to develop his skill and ability to find out the effects of different feeds on the yield of the milk.

4. Lesson topic: Seed Testing before Sowing

Specific Objectives

(a) to develop in students an understanding and knowledge for selection of good seeds,

(b) to develop skill and ability in creating a proper environment for good germination,

(c) to develop skill and ability to test seeds for germination by the recommended methods.

These lists of four lessons with their teaching objectives are only examples. You may see the need for further objectives in each of these lessons. Whatever you do be sure that for each lesson taught you have thought of and listed the specific objectives or aims which you wish to accomplish.

Implications of Objectives

While implementing these major and supplementary objectives certain procedures and principles are either evident or assumed. The implications of cause and effect in these objectives are:

1. that a more thorough job will be done if the aim of giving a vocational bias guides the teacher and administrators

2. that if purposes are limited to the cultural values and appreciations of agriculture, it will only tend to encourage passing examinations unless a radical change is made in the syllabus

3. that learning to a doing level is essential to achieve the objectives of vocational agriculture

4. that good teaching methods and efficient learning require emphasis on manipulative and mental abilities

5. that local decisions should be encouraged as to course content, instructional materials and planning

6. that concrete evidence of student accomplishment will secure public support for this stream

7. that the teacher must have an adequate education to prepare him as a master teacher as well as a master of his subject

8. that the teacher possesses both professional and subject competency.

CHAPTER II

THE TEACHER

Introduction

It is a recognized fact that the teacher is the main driving force in the educational process, from which it follows that proper selection, co-ordination and use of this force is most essential to the success of education.

As agriculture is our basic and most important industry and is varied in the skills and knowledges it encompasses, the agricultural teacher who guides the boy to success in this occupation, occupies a pivotal place where he has to perform many duties and exercise qualities of strong leadership.

In this chapter are indicated some of the responsibilities, characteristics and action of the successful agricultural teacher.

Qualifications and Characteristics

(1) To become a successful agricultural teacher, you should have had farming experience and a degree in agriculture with knowledge of animal science, agronomy, agricultural engineering, dairy science, poultry farming, agricultural economics, horticulture and physics and chemistry.

(2) You should have had training in the methods of teaching agriculture.

(3) You should have the skill and ability to apply your knowledge of agricultural practices and techniques.

(4) You should have executive ability to manage the school farms, cattle, poultry, classroom and laboratory and the staff under you.

(5) You should have the technical ability to use the various farm machines, laboratory equipment and instructional materials.

(6) You should have the creative ability to improvise tools and machines.

(7) You should be dynamic in your approach and should not depend exclusively on conventional methods.

(8) You should have proper understanding of your students and good control over them.

(9) You should have a sense of humour to carry you over discouraging situations.

(10) You should possess the ability to take defeat cheerfully and to use it as a spring board for another try.

(11) You should be willing to accept civic responsibilities and community leadership as these qualities are necessary to win for you the respect and confidence of the community.

(12) You should of course, be physically fit.

(13) You should be a man of integrity, honest in your dealings with others and honest with yourself.

(14) Lastly, for, your own happiness, you should have varied interests in fields of culture and recreation.

Besides these qualifications you should develop, if you do not possess it, the strong characteristic of being able to accept unfavourable and often discouraging situations. The following are representative of such conditions:

(1) You should accept the authority and decisions of the headmaster or state officials. However good you feel your ideas and plans may appear to be, if your superiors cannot support them you should learn not to insist or feel offended or discouraged.

(2) You have to work very hard. Out of school hours you will have to pay attention to the live-stock and field management and render community service.

(3) As soon as you become a teacher, there will be many restrictions on your personal freedom.

You will agree that all the characteristics given are important. There are many others and you may wish to refer to a leaflet developed by graduate students in agriculture in California U.S.A. which is reproduced below:[1]

PROFILE OF A GOOD AGRICULTURAL TEACHER

The Class and Farm Teacher

He organizes and plans his work.
He uses good teaching techniques and procedures.
He develops student interest through his enthusiasm.
He has control of his classes.
He tempers firmness with kindness and consideration.
He supervises farming activities effectively.
He counsels and guides his students with judgement.
He understands farm boys and farm problems.

The Technician

He knows the production, management, and marketing of the community farm products.
He can effectively handle the mechanical needs of the farms in his community.
He continually seeks to improve himself technically.
He has had experience in farming.

The Professional Leader

He is dedicated to his career as an agricultural teacher.
He is loyal to his profession.
He has the desire to serve rural youth.
He has capacity for growth and strives for professional improvement.
He is willing to co-operate with administrators and others in his profession.
He can express himself effectively.

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[1] Lesson Leaflet, State of California, Department of Education, San Luis Obispo, California, 1956.

(4) The servants: Management of servants is a difficult problem but it can be eased by good relations with them. Detailed instructions to them, vigilance at all times, and fairness, are all necessary if they are to be your willing workers.

(5) Community leaders: However efficient in your work you may be, if you have not the confidence and respect of the leaders of the community you cannot succeed and you will not be happy. Ask their advice. Invite them to visit your stream, and accept their offers to assist you.

(6) Government Officers: Your work is connected with such departments of the government as education, agriculture, supply and marketing and finance. Do not over-look any occasion to visit with them so they may become better acquainted with you and with your work.

Starting on a New Job

The following points can serve as your guide of action and responsibilities if you are going to join a new post as an agricultural teacher:

(1) Get acquainted with the headmaster and make known to him your willingness to follow his suggestions and to co-operate with him.

(2) Be sure that new ideas are discussed with, and are accepted by your headmaster.

(3) Get acquainted with your colleagues and other school employees.

(4) Study the procedures of the school regarding the prayer, the time-table, submission of exercise-books, and pay and leave rules.

(5) Try to be a homogeneous part of the school by taking active part in its activities without taking essential time away from your own stream.

(6) Become acquainted with the agriculture of the community.

(7) Learn all about the agricultural stream and the future plans as well as your future prospects.

(8) Get acquainted with the facilities of your stream.

(9) Study school farm problems.

(10) Get to know the climatic conditions of the area.

(11) Get acquainted with your students and their parents.

(12) Plan your first year's work.

(13) Arrange for your instructional material and other classroom and farm needs with the advice and approval of the headmaster.

(14) Create proper conditions and a suitable atmosphere for student learning. This will require a careful study and good knowledge of class management and of teaching methods and techniques.

(15) Offer your assistance to those people or organisations that give their time to community service and improvement.

Advantages and opportunities of the Agricultural Teacher

There are many fine things about the profession of agricultural education and many reasons why you as an agricultural teacher will like the work and be dedicated to it. It can be very interesting if you resolve to make it so:

(1) It is a creative and challenging work.
(2) It is healthy, being mostly out in the open air.
(3) You work with many people besides students.
(4) You will have rich opportunity to be of service to rural people.
(5) You have opportunity to be a leader in the community.
(6) If your job is well-done, it will draw appreciation from parents and others.
(7) Teaching agriculture is an excellent stepping stone to better employment. Any good teacher of agriculture wishes professional advancement and he may feel he has special aptitudes for other agricultural occupations which some day he can enter. A list of these may be of interest to you:

(a) Education: Your present job is a very good stepping stone to such other professional positions as college lecturer and district or State agricultural inspector.

(b) Research: Production, marketing, economics, agricultural engineering, processing, biproducts, reclamation and rural sociology.

(c) Industry: Agricultural machinery and equipment, grain and seed processing, meat and poultry packing, pesticides and herbicides, fertilizers, dairy processing and forest products.

(d) Business: Cooperative management, marketing, storage, warehousing and transportation.

(e) Communication: Farm reporting, newspapers, photography and agricultural journalism.

Self-Evaluation

Some day you may wish to take an objective look at yourself in the mirror and rate yourself as a teacher and citizen. If you can do this objectively and without prejudice, this self-evaluation scale, adapted from a teaching manual prepared by the Bureau of Agricultural Education in the State of California, U.S.A. may be of real value to you.[1]

Ability as a teacher	Very good	Good	Fair	Unsatisfactory
1. Organizing and planning work				
2. Directing study and class instruction				
3. Directing laboratory and field instruction				
4. Maintaining interest				
5. Maintaining discipline				
6. Care of rooms and equipment				
7. Understanding of pupils				
8. Supervising farming programmes				
9. Supervising co-curricular activities				

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[1] A Guide to Directed Teaching Activities, Sacramento, California, U.S.A. State Department of Education, Bureau of Agricultural Education. 1951.

Professional equipment	Very good	Good	Fair	Unsatisfactory
1. Attitude and loyalty towards teaching profession				
2. General intelligence				
3. Capacity for growth				
4. Willingness to cooperate				
5. Ability to take suggestions and criticisms				
6. Ability to express himself				
7. Understanding of farmers and farm problems				
Personality and Personal Characteristics				
1. Leadership				
2. Diplomacy and tact				
3. Enthusiasm				
4. Initiative				
5. Personal appearance and neatness				
6. Dependability				
7. Promptness				
8. Poise and self control				

Technical Ability and Knowledge	Very good	Good	Fair	Unsatisfactory
1. Of general livestock				
2. Of dairying				
3. Of poultry				
4. Of field crops				
5. Of vegetable crops				
6. Of fruit crops				
7. Of landscape gardening and nursery				
8. Of other tropical crops (specify)				

CHAPTER III

ORGANISATION OF STREAM

A clear understanding of the instructional phases of the agriculture course is the first need of the agriculture teacher. It helps in a better organisation of the course, educationally sound and progressive systems of curriculum construction and the best arrangements for the time-table or weekly schedule. It also helps in breaking up the syllabus into suitable courses of study or teaching units, and in planning the entire work ahead.

The Curriculum

The school curriculum is a list of, and a systematic arrangement of courses to meet the educational needs of the students. Each stream or course also has its curriculum of subjects.

A good curriculum should have the following characteristics:

1. It should be flexible and adapted to the needs of individuals.
2. It should be adapted to the local situation.
3. It should meet the needs of youth.
4. It should meet the demands of both College entrance and of a terminal education.
5. It should be dynamic and true to life.
6. It should give primary consideration to the immediate needs of the student.[1]

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[1] BENJAMIN, HAROLD, Principles of Secondary Education, New York, Mcgraw Hill Book Co., 1955, p.208

The Time Table

The time-table or schedule of classes at the school is the teacher's guide to when the stream work should be done. It may become necessary for the agriculture teacher to suggest modifications in the time-table, in order that the weekly schedule will be of greater value. In order to do so with good judgement, it is well to understand the criteria which a good time-table should satisfy:

1. It should be flexible, allowing of changes when found necessary.
2. The length of periods, both theory and practical, should be considered in the light of their needs.
3. It should take into consideration the incidence of fatigue among students and teachers.
4. It should provide for necessary allotment of hours or periods to the various subjects.
5. Equipment and facilities may affect the arrangement of the time-table.
6. Teacher-load is an important consideration in building a time-table.

The following general considerations may also be of value in arranging the time-table of the agriculture course:

1. The load of the agricultural teacher should be approximately 12 theory, 12 farm practical, and from 12 to 16 farm supervision periods or hours per week.

2. One session during the week, such as on Saturdays, may be reserved exclusively for agricultural field work, if this is practicable.

3. Two consecutive periods for each agriculture class would be beneficial, especially in laboratory work.

4. Theory periods should preferably be held in the mornings.

5. Each teacher should handle the practical as well as the theory work of his allotted classes.

6. Schedules should provide an increasing amount of time to agriculture as the students advance from the 9th, 10th and 11th standards.

7. Special time should be allowed during the week for co-curricular activities, especially where such activities are closely related to the subject.

Developing a New Agricultural Stream

Once the agricultural course is started in a higher secondary school, it becomes the responsibility of the agriculture teacher to further develop the stream, so as to arouse students' interest in agriculture, and to give a better understanding to parents and community regarding the stream and to draw their support.

The following steps would be found helpful in effecting such an organisation:

1. Get acquainted with the facilities available such as the school farm, its location, the suitability of the classroom and laboratory in view of the demands of the syllabus, etc. and determine the problems and needs.

2, Classify and inventory the equipment and facilities accurately and scientifically, and list your needs as to new facilities, make notes as to their justification, and if possible indicate an estimated cost. This will give you a complete and convincing picture of what you must plan for.

3. Start the organization of the different sections of the stream:

a) Determine the need for further staff, and draw up the schedule of responsibilities for harmonious and smooth operations.

b) Determine what records and registers should be used, and how they are to be kept and by whom.

c) Arrange for supervision work of the farm.

d) Arrange for staff meetings to co-ordinate the work of different sections.

4. Arrange the classroom, laboratory and farm facilities in such a manner that they are easily available and known to the students.

5. Secure the cooperation of those persons in authority on whose support you must depend by discussing your plans with them and by acquainting them with your plans, needs and problems.

The Long-Term Plan

Long-term planning is indispensable for the continue-d improvement of any course and progressive and successful teachers the world over have been convinced of this truth. Not only is it of value to you in your programme

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at your school, but if you happen to be shifted to another school, it would be of great benefit to the teacher who takes your place and would ensure continuity of organisation. Such a plan should cover a period of three to five years.

The outline which follows is intended to serve as a guide in drawing up the outline for a long-term plan.

A. Introduction to the plan

1. Describe briefly the existing situation
    - a) Climate, rainfall, growing seasons
    - b) Population and type of farming enterprises
    - c) Soil conditions, irrigation
    - d) Extent and kinds of livestock
    - e) Markets
    - f) School farm problems, labour available
    - g) Curriculum, syllabus and time table problems
    - h) Enrolment in agriculture. Rural and city students.

B. Proposals and Recommendations

1. The Instructional Programme
    - a) Recommendations for the time table
    - b) A course of study prepared with the help of other agricultural teachers

c) Suggestions as to improved system of assessment in the subject

d) How to handle students on the farm, classroom and for individual instruction

e) Plans for self-owned and group projects by the students.

2. Special Student Problems

a) How to acquaint the eighth grade students with the benefits of the agricultural stream

b) A schedule of visits to parents' farms

c) Cummulative and follow-up records of students

d) Organized guidance programme for the boys

e) Plans for co-curricular activities

f) Enrolment of students - number and type.

3. The Multiple-teacher Stream

a) Recommendations regarding the strength of agricultural staff

b) Recommendations as to teacher accommodations on the school campus

c) Suggestions regarding control and relationship problems

d) Programme of departmental staff meetings for planning.

4. Facilities

a) Plans for buildings, floor plans and arrangements

b) Furniture and similar needs and when needed

c) Detailed plans for a farm maintenance workshop, especially if there is none at present

d) Needs and plans for instructional and other audio-visual aids

e) Needs of the farm as to fencing, wells, and equipment

f) Additional labour if any needed, or reduction of servant staff if superfluous.

5. The Cropping Schemes

a) A chart of the farm and its crop rotations, water system and seasonal cropping

b) Plans for increasing crop production such as improved tillage, fertilization and irrigation methods to use during the next three years.

6. The Animal Science Scheme

a) Plan the kinds of livestock and other animals desired such as poultry, dairy etc.

b) Breeding plans, seasons for birth etc.

c) Numbers needed, and expected increase

d) Plan of operation including feeds and feeding, correlation with cropping scheme, labour schedules, and supervision programme

e) Plan of programme for student participation

f) Suggested plans for marketing animal products and disposal of sick or aged animals.

7. Community and School Support

   a) Steps to be taken to make crop and livestock production a model for the community

   b) How to use the school agricultural association for making the stream better known to the community

   c) Plans for exhibitions of the work done in the course, parent's meetings, and such activities over the next three years

   d) Plans for making the school a community centre.

C. The Conclusion to the Plan

   1. Re-emphasis of the important points

   2. Achievements expected to be accomplished

Precautions

It is well to remember that this plan should be the result of the thinking of the teachers of the agriculture stream and should represent what they consider feasible to achieve during the next three years. In order to ensure success, the following points may be worth bearing in mind:

1. Do not fail to accept help and suggestions from others.
2. You should be thoroughly acquainted with the community, the school and the stream before you attempt to make out a long-term plan.

3. Do not try to include every thing suggested above in your Plan. If you are perfectly satisfied with every thing as it now is, there is no need for a plan. If nothing is as it should be, then you might have to make plans for nearly every item suggested in the proposed plan. Under normal conditions you will concentrate on those things which are needed and which will improve your stream. Exercise judgement and discrimination.

4. Many people make excellent plans which are never implemented. Therefore, suggest and plan things which are possible of fulfilment. Be dynamic and progressive in your thinking.

AN EXAMPLE OF A LONG-TERM PLAN

An example follows of what one teacher has done on one part of his long-term plan. It shows his school farm needs and cropping scheme for three years together with a plan of his school farm. You may wish to refer to the long-term plan, item 5, 'the cropping scheme'.

Three - Year Plan for School Farm

1960- 1963.

A. Equipment and planting Needs

First Year

1. Hedge planting-other trees.
2. Planting of acacia.
3. Construction of manure pits.
4. Purchase of wooden implements.
5. Partial electrification.
6. Wire fencing.
7. Repair of well A. (see plot plan)

Second Year

1. Repair of well B.
2. Construction of threshing floors
3. Construction of cattle and implement sheds.

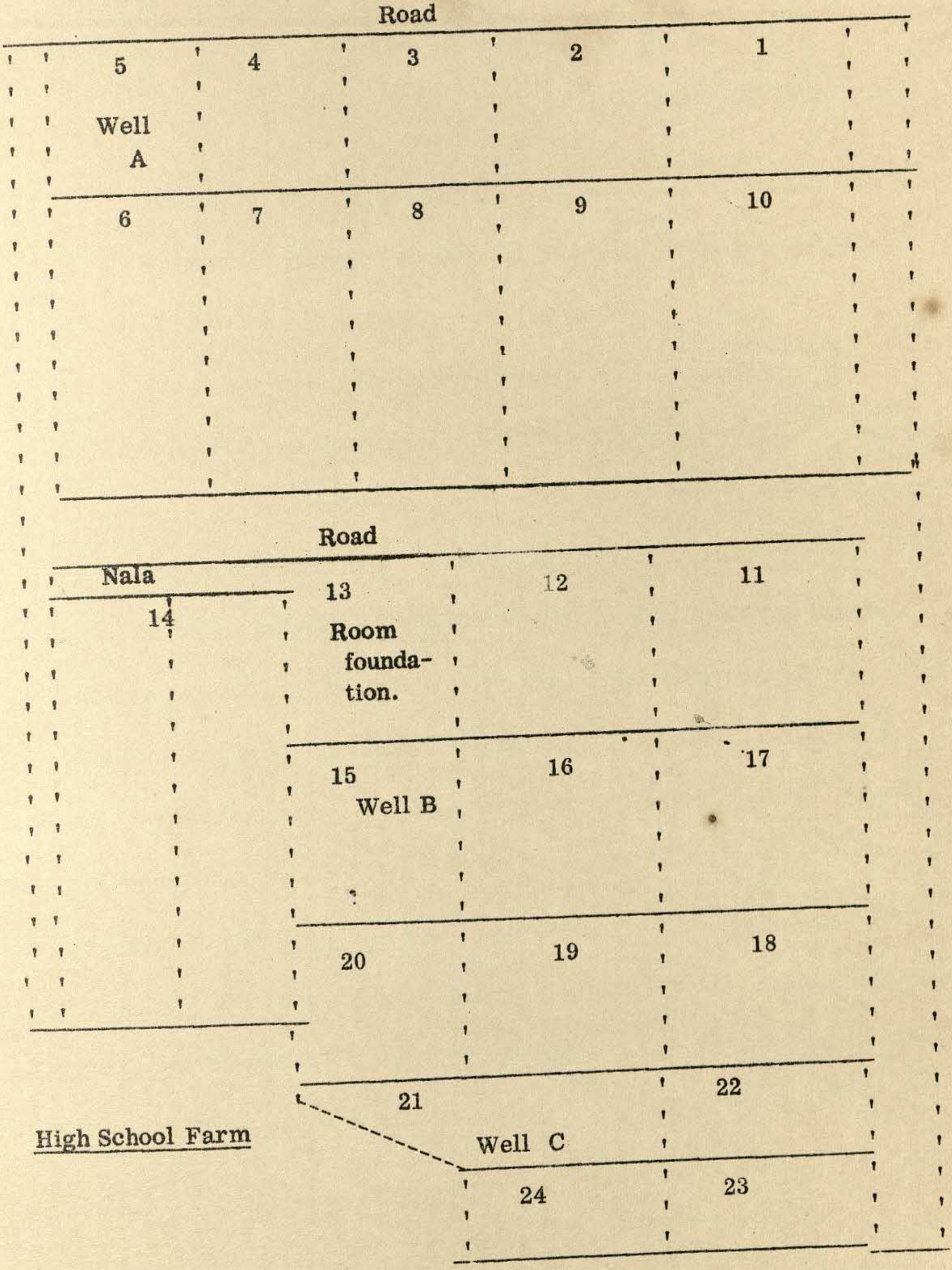
   (Note: At the time of construction of sheds, provision will be made for the addition of dairy and poultry husbandry. A fresh plan will have to be made for these additions.)
4. Construction of store room.
5. Installation of centrifugal pump at well A.
6. Completion of electrification.
7. Purchase of needed implements.

Third Year

1. Repair of well C.
2. Construction of additional classroom.
3. Installation of centrifugal pump.
4. Completion of plantation.
5. Completion of hedge planting.

B. Cropping Scheme

Plots	Particulars	Season
1 to 4 7 to 10	Sorghum and ground-nut in rotation with ploughed fallow	Kharif Winter and Summer
6	a) Paddy b) 1/2 acre fallow; 1/2 acre vegetables	Rainy Winter and Summer
11, 12, 16	Reserve place for cattle shed, manure pit and fodder stacking	
13, 15, 20	Reserved for botanical garden	
17.	Reserved for outdoor games.	
14	a) Paddy over the full area b) 1/2 acre fallow; 1/2 acre paddy rotation	Monsoon Winter
18, 19, 21, 22	a) Sorghum, ground-nut or small millets b) Kulthi	Kharif Winter
23, 24	a) Special variety of paddy adjustable to water level b) Gram or Kusum	Rainy Rabi or Winter
20, 21, 23, 24	Vegetables or Paddy	Winter and Summer Rainy.



High School Farm

CHAPTER IV

JOB ANALYSIS OF AN AGRICULTURAL ENTERPRISE

It is not uncommon for the teacher who is just beginning on his job to have much difficulty in outlining the details of his daily lessons even though a syllabus may give him a partial guide.

One of the best methods known to stablize the teacher's thinking is to analyze all the subjects he will teach during the three years of the course. A job analysis indicating the breakdown of each subject matter field into its smallest parts, will be of much help to him.

All enterprises (see glossary) such as wheat, poultry, mangoes or bees, constitute operations which are subjected to job analysis. Poultry and cotton have been analyzed here as illustrative examples.

The headings preceded by the numbers 1, 2, 3 and so on, are the major teaching areas within each enterprise. They are some times called job groups, sub-divisions of the enterprise, or just teaching units.

The jobs themselves, preceded by small letters, are the real problems, or the parts of a lesson to be taught, and these call for answers or learning by the student.

The non-enterprises mentioned in the course of study to follow later, differ from the enterprises in the fact that the subject matter field is not directly related to only one farm product or operation. Soils, plants life and fertilizers fall under the category of non-enterprises.

JOB ANALYSIS - POULTRY

1. Present Status - Situation of Poultry in India
    - a) What is the importance of poultry in India? In your State? In your community?
    - b) Is poultry raised commercially in your community?
    - c) What is the cost of poultry to eat? Poultry eggs?
    - d) What steps are being taken by Government poultry farms to improve and advance poultry in India? In your state?
    - e) What are the advantages of raising poultry on a farm?
    - f) What are some of the disadvantages?
2. Breeds and Types of Poultry
    - a) What are the most important breeds of poultry in India?
    - b) What are the most common types and varieties?
    - c) What is their origin?
    - d) What are the characteristics of each?

4. Raising Chicks and Young Poultry

   a) What are the advantages and disadvantages of raising chick with a hen? Under a brooder?

   b) How many chicks can a hen handle?

   c) How can the number to be put under a brooder be determined?

   d) What equipment is necessary for use with the brooder?

   e) What heat is needed during the time the chicks are under a brooder?

   f) What feed is given? How much?

   g) How are the chicks taught to eat and drink?

   h) How are they controlled under a brooder?

   i) How long should they remain under a brooder?

   j) What types of brooders are available?

   k) How are sick chicks identified?

   l) What diseases can be expected in baby chicks?

5. Raising Young Poultry

   a) What are the feeds needed for growing chickens?

   b) What should be their rate of growth?

   c) How will the cockerels be disposed of?

d) At what age or weight should the pullets begin to lay?

e) What disease control is necessary during time of growth?

6. Care and Management of Meat Birds

a) When should the cockerels be separated from the pullets?

b) How and what should they be fed for later sale for meat?

c) How can pests and diseases be detected and controlled?

7. Care and Management of the Laying Flock

a) What should be the care and management of pullets?

b) What are good feeds for laying? How much should be fed?

c) How can you tell when pullets begin to lay?

d) How can you identify a pullet egg?

e) What type of pens or control should be used for the laying flock?

f) What is the optimum production of eggs that should be expected?

g) What equipment is needed for the laying flock?

h) What provision should be made for sanitation for clean eggs?

8. Pest and Diseases of Poultry

a) What are the most important pests affecting poultry?

b) How can they be identified and controlled?

c) What are the most important diseases of poultry?

d) How can they be identified and controlled?

e) What part does sanitation play in disease control?

f) What medicines and equipment are needed for control of pests and diseases?

9. Improvement of Poultry

a) What are the advantages of culling and how is it carried out?

b) When is culling done? What is the difference between culling growing chickens and laying hens?

c) How can production be increased by the purchase of eggs or baby chicks?

d) How many hens should there be for one cock bird?

e) Should cocks be allowed to run with the egg producing flock?

f) What principles of breeding should be observed to improve the flock by the purchase of male birds?

JOB ANALYSIS - COTTON ENTERPRISE

1. The Cotton Situation in India

a) What type of climate is required?

b) How adaptable is cotton to the seasons when irrigated?

c) What time of year is favourable for its sowing?

d) What is the production of cotton in India?

e) What production of the crop is exported, if any?

f) Is India's cotton considered of good staple and quality?

2. Soil Preparation and Planting

a) What type of soil is required?

b) What fertilizers and quantities are recommended?

c) How is the soil prepared with fertilizers?

d) What soil preparation is needed for sowing cotton?

e) When is the right time for sowing?

f) What are the recommended varieties of seeds?

g) How would proper varieties and types of seed be selected?

h) What are the different methods of sowing, and advantages of each?

i) How is cotton sown?

3. Crop Culture

a) When should weeding operations begin?

b) What weeds cause the most trouble?

c) What methods of weeding should be used?

d) What fertilizers can be applied after the cotton is planted?

e) What is the proper time for applying water?

f) How should it be applied, and how much?

g) Should there be cultivation of cotton after it sprouts.

4. Diseases of Cotton and their Control

a) What are the seed carried diseases of cotton?

cause
b) What root and plant diseases/the greatest damage?

c) What are the recommended controls and cure for these diseases?

5. Harvesting

a) When should the first picking start?

b) What is the recommended method of harvesting?

c) What place has mechanical picking in India?

d) When should the last picking be?

e) What are the by-products of cotton? How are they used?

f) How is the cotton cared for while awaiting shipment to the market?

6. Storage and Marketing

a) When is the proper time for selling cotton?

b) How is cotton transported to market?

c) What storage problems are there for cotton?

d) What are the advantages in selling (i) to cooperatives and (ii) to the private buyer?

e) How can wastage be prevented in storing and in marketing?

f) What can the farmer do to improve his returns from cotton?

7. Management Factors in Cotton

a) What are some of the labour problems for cotton farmers?

b) How can they be settled?

c) How can the cotton farmer best utilize the boundaries of his cotton field?

d) What soil conditions can be expected after the removal of the crops?

e) What conditions must there be in order to have a second crop?

f) What is the advantage of crop rotations with cotton, and what crops can be used?

g) What records should a farmer keep of his cotton farm with regard to labour, yields, operations, costs, and receipts?

h) What plans should he follow to increase the income from cotton on his farm?

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CHAPTER V

THE COURSE OF STUDY

A course of study is essential because it gives the teacher a guide for his work for each year of the course, helps him analyze the community and student needs, shows the relative importance of, and the time needed to cover each phase of the syllabus, helps determine the objectives of the course and ensures planning in advance. Below are detailed the various steps in preparing a course of study:

Step I

Develop criteria for selection of enterprises and the areas of subject matter to be taught.

In order to determine the importance of different items, you should ask of yourself certain questions on which to base the selection of enterprises, teaching areas and lessons to be taught over the three years. The following constitute a set of criteria which you might use to determine what should be included in your course of study and how much importance you should place on an enterprise or teaching area:

1. Is this teaching area important to the community?
2. Is it recommended in the syllabus?

3. Is it an area which should be added to the syllabus?
4. Is it important for the student who will go on to an agricultural college?
5. Is it important to the student who returns to the farm as a cultivator (terminal education)?
6. Is it within the learning scope and understanding of the student?
7. Are teaching resources available?
8. Will social and religious customs approve of it?

Step II

The next step in constructing a course of study is to determine the enterprises and non-enterprises to be taught during the three years, and the time to be given to each in terms of periods. (See Form I)

1) Determine the total number of periods the pupils of each class will attend class sessions in agriculture plus the periods spent in practical work outside school hours. The total number of periods allotted to the agricultural subjects in the first year may be different from the totals of the second and third years.

2) Now list all the enterprises such as sheep, cotton and tomatoes which you have decided to teach. Do the same with the non-enterprises such as soils, fertilizers and co-curricular activities. There will probably be 10 to 12 of each. Do not include subject matter fields in agricultural chemistry and botany, but only strictly agricultural subjects relating to farm production or the leadership objectives of students.

3) Put down the number of periods estimated for the year for each of the subjects listed. The totals of column 1 (Ist year) should equal the total number of periods estimated for student classes and practical work. The same holds for columns 2 and 3.

4) The totals of all the teaching enterprises and non-enterprises should equal the total periods available.

5) Note the partial example written in on form I. Not all enterprises or non-enterprises have been listed, but this example should help you in understanding the second step.

Step III

Determine the number of periods to be given to the sub-divisions of each enterprise and non-enterprise, for each year. (See form 2).

1) Study your job analysis. Then, using a separate form 2 for each enterprise and non-enterprise, determine the teaching areas or job groups under each.

2) Allot the number of periods which you consider necessary for each sub-division (teaching area) during each year of the course. Note that the total number of periods given to an enterprise on form 1 over the three years should equal the total periods given to all the sub-divisions of that enterprise on form 2. Study the examples given on form 2.

Step IV

Determine the seasonal time distribution, by periods, of each of the enterprises and non-enterprises and the sub-divisions under each (See form 3).

1) Post the enterprise and its sub-divisions as listed on form 2 to form 3. Note that form 3 is only for one of the three years of the stream.

2) Determine in which season of the year you should teach each sub-division of the subject, but remember that you are now doing this for only one of the three years of the stream.

***

You have now completed a course of study, you know in what seasons you wish to teach each lesson unit, in which years to teach it and just what you are doing to teach. Do not worry if you find later that you cannot follow this course of study exactly. One of its values is that it is flexibleand you can change it as needed.

FORM I

WHAT TO TEACH AND TIME DISTRIBUTION OVER THREE YEAR

I. Non-enterprises

		Periods per year			
		Ist	2nd	3rd	Total
1.	Plant growth	10	10	20	40
2.	Soils	5	5	5	15
3.	Annual metrients	2	8	5	15
4.	... (etc.)				
5.					
6.					
7.					
8.					
9.					
10.					
11.					
12.					
13.					
14.					
	A Sub-total, non-enterprise				

ENTERPRISE SUB-DIVISION AND YEARLY DISTRIBUTION BY PERIODS

Enterprise or
non-enterprise .... Poultry.

	Sub-division or teaching areas	Year			
		Ist	2nd	3rd	Total
1.	Status of Poultry	1			
2.	Breeds and types of Poultry	1	1		
3.	Incubation of Eggs		9		
4.	Raising chicks and young pests	1	2		
5.					
6.	(etc.)				
7.					
8.	Pests and diseases of poultry		3	3	
9.	(etc)				
10.					
11.	Marketing of poultry			3	
12.	(etc.)			(etc)	
13.					
14.					
	Total periods each year	3	10	20	33
	Total for enterprises or non-enterprise.	3	10	20	33

FORM 3

SEASONAL TIME DISTRIBUTION BY PERIODS FOR EACH CLASS

Agriculture Class (9th, 10th or 11th)		Periods per Season		
Enterprise and sub-divisions		Rainy Season	Winter Season	Summer Season
1.	Poultry		1	
2.	Status			
3.	Breeds (etc)		1	
4.	Raising chicks		1	
5.				
6.	(etc)		(etc)	
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				
16.				

CHAPTER VI

TEACHING GUIDES FOR AGRICULTURE

Methods and Techniques

The word method in education refers to a plan or system of action followed by the teacher as he attemps to develop favourable learning situations for his students. The choice of method andits resulting values depend first on the teacher, next on the learner and finally on the subject matter. Techniques and the skill in using them constitute the teacher tricks of the trade. Many techniques will be briefly discussed under the heading suggestions further on in this section. All these methods are being used by successful teachers and should therefore be studied and applied wherever possible.

Handling of methods and techniques requires insight, intelligence and practice. Perfection is attained only by practice and conscientious effort. Confidence in handling them will come with a greater understanding of their merits and limitations.

Methods

Various teaching methods are used and are suitable for different occasions, either singly or combined together to make lessons effective. The methods that will be discussed here are:

(i) The Lecture method

(ii) The Question-answer method

(iii) The Laboratory method

(iv) The Demonstration method, and

(v) The Project method.

(i) Lecture method

This method is too often followed in the classroom without any consideration of its limitations. It does, nevertheless, have some merits.

Merits:

1. It covers much subject matter in a limited time.
2. It facilitates breaking down the subject matter into logical steps.
3. It presents the different parts of the subject matter at a time.
4. It is easily followed by most students.
5. It can be used with large classes.

Limitations:

1. It may make passive listeners of the students.
2. It is difficult to maintain student interest with this method.
3. It is more useful for older and high intelligence groups.
4. The 'doing' side of learning is almost totally neglected.
5. There are few contacts between the teacher and the pupils.

Precautions:

1. Make sure that the topic is not too advanced for the age group.
2. Ensure that all sub-topics are in logical sequence.
3. Adopt this method only if some other method will not do better.

4. Use many teaching aids such as illustrations, chalk-board, models and filmstrips to supplement this method.

Example of a lesson plan for the lecture method:

Subject: Chemistry in agriculture. Class: IX. Period:1

Lesson: Nitrogen cycle in nature.

Objectives: 1. To get students to understand the importance of nitrogen for agriculture.

2. To develop knowledge in students of how nature manufactures nitrogen.

Aids: Chalkboard, pointer, chart showing nitrogen cycle.

Presentation: Lecture. Students to take notes. Use the outline which follows:

a. Introduction
b. Types of nitrogenous materials, organic and inorganic.
c. Nitrification and denitrification.
d. Ammonification.
e. Nitrogen cycle (use charts).

Evaluation: Grade pupils' note books. Give short objective test. Ask students to explain the chart.

(ii) Question-answer method

This method depends on putting thought-provoking key questions to students. Supplementary questions are put to develop the subject matter gradually. It is a method quite generally used among all teachers, especially those of agriculture. When the teacher encourages informal discussion among students in order to bring out the answers, the method is sometimes called a discussion or conference method.

Merits:

1. This method requires all students to be mentally active.
2. Logical thinking is promoted.
3. It can easily be used with other methods.
4. The teacher may build on what the students already know, thereby creating interest.

Limitations:

1. It may take too much time if the teacher is not careful, especially if informal class discussion is allowed.
2. The slow students may become lost or confused as to the importance of the key questions.
3. The teacher is inclined to allow a few bright students answer the questions.

Precautions:

1. Questions should be carefully planned and in logical sequence.
2. Use variety in the manner of asking questions.
3. Use plenty of teaching aids, especially the chalk-board, in order to lead up to or explain key questions.
4. Observe techniques of questioning.

Example of a lesson plan for the question-answer method

(See the comprehensive lesson plan given in the next chapter. Its topic is "Feeding and Care of Baby Chicks." Each phase of chick production such as disease control, feeding, heat, and equipment should have at least one key question, either to indicate what must be learned or to draw a conclusion. The teacher may assign study before or after the question-answer session, as he considers suitable. It may be noted that other methods are also used in this plan.)

(iii) Laboratory method

This method implies that the student will develop new concepts and understandings through experimental activities dealing with concrete situations leading to specific conclusions. Most of this work will be done in a well-equipped laboratory, but it can also be used outside, for instance, in a lesson dealing with "The Layout of a Garden."

Merits:

1. Students attain mastery of the subject as they themselves do the experiment and draw conclusions.
2. Students become active participants, and learn by doing.
3. The teacher assumes the role of guide and counsellor.
4. There are many opportunities to encourage students through individual contacts.
5. When the method is carried out on living and growing things, it ceases to be strictly experimental and becomes productive and hence more educative.

Limitations:

1. It too often attempts only to prove a theory rather than to teach something practical.

2. It is good in agriculture if it leads the student to more knowledge, understanding and proficiency.
3. It often gives too much time to minor or impractical points.
4. It does not often result in a logical sequence of learning and frequently leaves out many significant points.
5. It may be expensive because of the equipment required.
6. It may become almost as lazy a way of teaching as the lecture method, especially if confined to the written instructions for laboratory work.

Precautions:

1. See that the laboratory work becomes purposeful, and that it is not reduced to a 'play with appratus'.
2. See that each student is well prepared with his record book, previous knowledge of what he is to do and necessary equipment.
3. Give guidance at all times, especially to the slow and awkward student.

Example of a lesson plan for the laboratory method

Subject: Chemistry in agriculture. Class: IX. Periods: 2.

Lesson: Acids and alkalies.

Objectives: To gain basic knowledge of the action of acids and alkalies.

To gain an understanding of the role of acids and alkalies in agriculture.

Aids: Common acids, common alkalies, teststubes, crucible, saw dust, barium chloride, copper filings, rod, spirit lamp, litmus paper (red and blue).

Preparation: Make sure that the student has an understanding and is interested in what he is going to do, and that his record book and materials are at hand.

Presentation: Give the student a test tube with an unknown liquid in it and ask him to find out whether it is an acid or an alkalie. Give instructions on safety measures and the use of note books. He will proceed to experiment and fill in the records.

Application:

Action	Observation	Conclusion
The material is tested with blue litmus.	Turns red	It is an acid
The acid is tested with a rod dipped in Ammonium Hydroxide	There is no effect	It is not hydrochloric acid
Barium cloride solution is mixed with the given acid	A precipitate is formed	It is sulphuric acid

Bring out by questioning how students reached the conclusion.

Evaluation: Put questions on blackboard to test their learning.

*****

(iv) Demonstration method

This method is very often used in agriculture as it is found most suitable when manipulative skills are to be taught. It combines the processes of showing how a job is done, and having the student do it later himself.

Merits:

1. This is a time-saving method for learning practical skill operations.
2. Interest is easy to arouse and maintain.
3. Demonstrations are limited to those operations which the student can himself do.
4. The need to demonstrate compels the teacher to learn and perform farm operations successfully.
5. Demonstration followed by student practice ensures that the student will learn to do the job as well as the teacher. This method therefore makes thoroughness a major learning requirement.

Limitations:

1. Some farm operations are too long for completion in one period.
2. Teachers are apt to think that the lesson is completed when they have shown how to do the job.
3. It takes much preparation on the part of the teacher.

Precautions:

1. Teaching aids such as charts and a blackboard may help, but should not distract attention from the operations themselves.
2. Prepare careful plans and job breakdown, and then practice the demonstration until you are sure you can do it before the students with confidence.
3. Make sure that the students know the purpose of the demonstration.
4. Keep your job breakdown war at hand in case you should need it.
5. Be sure that all equipment and supplies are at hand and arranged for effective use before the demonstration starts.
6. Do not talk too much as you demonstrate. If you must discuss the theory of what you are doing, do it after the demonstration is over. You should only tell the class what you intend to do and why, and the steps and key points of the demonstration as you do it.
7. Students should be so arranged that all can see the demonstration clearly and hear you distinctly.
8. Talk to the students and not to the appratus.
9. Keep students alert by throwing out a few questions to individuals from time to time.

10. Certain operations or steps may require temporary help of a student. This is good since it involves the student in active participation.
11. Take each step and each key point slowly and carefully. Watch your students to ensure that they grasp each step.
12. After finishing your demonstration, ask one of the students to come up to repeat the operation. Have him tell the class what he does just as you did. Correct and encourage until he does the job well. Then have him help other students. This is the most important part of your demonstration.

Example of a lesson plan for the demonstration method

(Note: In the following chapter you will find two lesson plans which calls for the demonstration method as part of the teacher's plans. There is also an illustration of a job breakdown.)

(v) Project method

Project make it possible for a student to learn through the means of a true-to-life or natural activity and may be carried out either individually or in groups. Each boy endeavors to find out the knowledge, skills and abilities needed to successfully complete an agricultural enterprise or a cycle of farm operations. This is the most successful method of teaching vocationally.

Let us for example, suppose that a group of ninth grade boys are learning to produce tomatoes on the school farm, or that a tenth grade student is learning to produce nursery stock on a small plot near his village. In each of these examples the student will 'learn by doing' under the guidance of the teacher.

Merits:

1. Perhaps the greatest advantage of this method is that the student will develop lasting interest in the subject largely because he is doing something that will profit him personally. As he learns both theory and operations, he will retain his learning better.
2. It gives a pleasant sense of satisfaction to the student to see concrete achievement.
3. It is based on the psychological belief that experience is the basis of real learning. It develops reasoning ability, a critical attitude, and good judgement in making decisions.
4. It develops qualities such as confidence, initietive, industry and perserverance which are not often developed through usual classroom methods.

Limitations:

1. It is a slow method as learning takes place no faster than the growth cycle of the lesson operations.

2. It may limit the learning to a relatively small field of operations.
3. It has usually got to be done after school hours.
4. All students may not reach the same level of progress.
5. The method cannot be evaluated by usual system of fit an artificial means of evaluation. The external examination which cannot measure the total progress of the boy.

Precautions:

1. This method of teaching will fail unless the teacher is well trained himself.
2. A plan of supervision to give guidance by the teacher is necessary.
3. The teacher will have to do more work.
4. Projects selected should be based on community life.
5. The teacher should attempt to fill in the gaps of learning by planning a careful course of study and by having students keep careful records of their projects.

Example of a lesson plan for the project method

(Note: As this method is usually used where practical true-to-life situations exist, the operations by the students may require many lessons to be learned. It is therefore doubtful if the teacher will need a lesson plan which will try to cover all his needs as he supervises the work of the students. He may, however, wish to make plans or lesson notes for the theory part of many lessons which becomes a part of the students' projects. In this case he will use the classroom methods best suited to the lesson.)

More on the project method

The project method is considered so important that further information, desirable for your understanding is presented below.

Home projects

This method is particularly useful in agriculture where the school frequently suffers from a dearth of adequate farm land. It is also most suitable for training boys vocationally for they do much of the practical work with their own crops or livestock on their own farms and under natural conditions. Certain special aspects of the method deserve mention:

a. A plan of work should be prepared by the student covering a season.

b. The project should be a part of the school instruction.

c. The home work should be supervised by the teacher.

d. Careful records should be maintained of the entire operation.

Operation of the home project

The plan of the project should be chalked out with the cooperation of the parents who will supply the operating capital.

Enterprises which are suitable for a home project are:

a. a few chickens

b. two or three sheep

c. a dairy cow and calf

d. a small plot of land with crops such as vegetables, flowers, paddy, wheat and nursery.

The plan should be well thought out and organized and should contain the following:

a. Total area or livestock numbers.

b. Name of crop or livestock.

c. A record of cultural or production operations such as number of ploughings, weed control, amount of seed, rental, self labour for crops, For livestock projects there should be records showing breeding dates, production, feeds used and amounts and so on.

d. Total receipts and total costs.

e. Profit.

Proper supervision of the project is essential. Necessary instructions should be given to each student from time to time, and a score card should be introduced to encourage the spirit of competition.

Every student should be encouraged to see the work of others.

Precautions

1. The students should be able to make their own choice of home projects with the advice of the parents and the teacher.

2. The cooperation of the headmaster and inspector is important. Discuss your scheme with them.
3. The projects should conform to the agriculture of the community.
4. When first introducing this scheme it might be well to concentrate on minor or partial projects such as spraying an orchard, purchase of a few lambs for later sale, incubation of chicks to be sold as growing chickens, or setting up and operating an irrigation system. Full enterprises can be taken up by the boy after his confidence is built up.
5. The student should be allowed to take off some time from school depending on the type of work needed on his project. This time should be limited to not more than the equivalent of one-half day per week. Caution should be exercised, however, to see that the boy does not take advantage of this privelege.

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TECHNIQUES

For Classroom Management

1. Open and close the work of the class on time.
2. Arrange the books, desks and chairs properly and leave the class room in proper order.
3. Maintain a convenient, systematic and permanent seating arrangement.
4. Maintain cleanliness inside the classroom. Keep almirahs, furniture and large instructional aids neat and clean.
5. Each class should be provided with a time-table, assignment lists, honours notices and duty charts. These and others such as lists of co-curricular activities and practical work done should be posted.
6. Use decorations wherever possible, especially those that relate to agriculture. Maintain a class museum.
7. Keep the class room well lighted and ventilated. Better work can be expected from students whose comfort has been well looked after.
8. Urge students to collect interesting news items and pictures and display them on a bulletin or tack board.
9. Let individual students be responsible for keeping the class records, roll books and daily diary of work done. Check these from time to time.

10. Adopt a form of dress for the students as well as yourself that will be appropriate for the kind of work to be done.
11. Provide tables for small group work or committee activities and for directed study.
12. If the class is small, arrange the tables and chairs in a semicircle or U shape to promote class discussion.

For Discipline and Control

1. Start class work punctually.
2. Be sure that all the students can see and hear clearly.
3. Stop disorder at its origin.
4. Demand respect and care for school property.
5. Be especially firm with new groups of students.
6. Handle all disciplinary cases yourself.
7. Deal with individual cases of discipline individually.
8. Make all reprimands with justice and tact.
9. Allow no play during class periods.
10. Find the actual cause of a student's poor work or poor attitude before condemning him.
11. Learn to ride your eye over the whole class.
12. Do not allow students to wander unnecessarily inside or outside the classroom.
13. Have affection and consideration for the student and expect respect from him.

14. Your best control is through interesting class work.
15. Recognize the fact that students have individual differences.
16. Employ positive rather than negative procedurres. Prevention of mistakes is better than correction.
17. Be courteous and tactful, and give suggestions rather than orders. If you must give an order insist that it be obeyed.
18. Use humour but not ridicule or sarcasm.
19. Weigh motives and causes before taking final disciplinary action.
20. Avoid the use of abusive language. Do not get excited or angry.
21. Make only necessary rules but once made enforce them with strictness.
22. Avoid assigning school work as a punishment. Make disciplinary action fit the deed.
23. Refrain from becoming too familiar with students.
24. Do not give a punishment that you cannot carry out.
25. See that your students do not live in fear.

For Motivation.

1. Teach only those topics which are useful to them in today's life.
2. Provide opportunities to learn in natural settings.
3. Be fine from the known and proceed to the unknown.

4. Allow students to relate their own agricultural experiences to the lesson.
5. Involve every student in discussions and activities.
6. Use methods and techniques that will not allow the student to be only a passive listener.
7. Encourage out-door activities whenever possible.
8. Allow the students to think out and suggest the many parts of a lesson.
9. Make the student feel that the problem or lesson is worth while studying.
10. Stimulate careful and good thinking by refusing to accept hasty answers.
11. Use audio visual aids to help motivation, but be sure that they advances the learner toward the learning objective, and is not given for interest only.
12. Help to arouse interest by explaining the purposes of the leason.
13. Use simple competitive activities to draw interest.
14. Be enthusiastic. It is contagious and will help to motivate.
15. Try to achieve your objectives. This makes for sustained interest.
16. Tie yesterday's lesson with today's interest will be sustained.

17. Let students participate in determining what lessons are to be taught. Let them suggest the lessons to be taught during the next month from a list you place on the blackboard.

For Questioning

1. Put questions in concise and understandable form.
2. Avoid combined or involved questions.
3. Avoid questions needing an 'yes' or 'no' answer only.
4. Leading questions should as far as possible be avoided.
5. Completion type questions should be avoided.
6. Let your tone be clear and confident.
7. Put your questions to the whole class but ask individuals to answer.
8. Give students time to think before expecting an answer.
9. Do not allow mass answers.
10. Elicit answers from all and not only from the smart students.
11. Give encouragement to all. Commend those who answer questions correctly, but simplify and assist those who have difficulty.
12. Expect and insist on full sentence answers.

13. Questions should be of proper difficulty to fit the majority of the class. Learn to get their reactions.
14. Supplement your questions and make them more understandable by using the blackboard and other teaching aids.

For using Audio-Visual Aids

1. Provide a variety of aids.
2. Always check carefully worth of any aid.
3. Study the material carefully. Review films and filmstrips, and get to know what each item is about.
4. Be sure that aids such as charts and illustrations are large enough to be seen by the class.
5. Aids should be so placed that they are visible from the entire viewing area.
6. In preparing charts or drawings leave out all un-necessary details.
7. Choose the appropriate time to present charts or other aids of that nature.
8. Be sure that students are acquainted with the name and purpose of the illustration or aid used.

9. Do not get lost in extraneous material even though it may be of interest.
10. Display only one aid at a time.
11. Suitable questions may supplement the aids.
12. Plan the use of the material before the class period.
13. Use a pointer to prevent obstruction of the view.
14. Use no aid that will take a longer time to explain than the class period.
15. Remove aids immediately after their use and store them away properly.
16. Use materials prepared by you or preferably by your students and with subject matter of local interest.

CHAPTER VII

TEACHING GUIDES FOR AGRICULTURE

Lesson Plans - Evaluation

A lesson plan or lesson notes may be as simple or as extensive as you wish. You must only be sure that it serves its purpose as a guide and control for you as you teach. It may be for a one-period lesson such as 'Treating Cows for Lice', or for a longer lesson covering a number of periods such as 'Control of Cotton Diseases and Pests'. It may be for classroom theory work only, such as 'How Soils are Formed', or it may be a plan for teaching manipulative skills such as 'Preparing a Seed Bed for Tomatoes'. It may also be a lesson plan covering a combination of mental abilities and manipulative skills such as 'Selecting Hens to Increased Egg Production'. Whatever the form, it is essential that you make a plan so that you may be fully organized and prepared when you meet your class.

The next few pages will explain lesson plans and how to prepare them.

The Lesson Plan

What it is

1. It is a carefully prepared outline of the unit of work which you plan to teach.
2. It makes a record for you of what to teach and how to teach it.
3. It is a flexible teaching aid which can be changed according to any new situation that arise.

Why it is needed

1. It stimulates thinking.
2. It clears the teacher's mind about his objectives.
3. It decides the method of motivation.
4. It correlates previous information with the new.
5. It guides the teacher as to how, when and what to do.
6. It helps the teacher to arrange for, prepare and use his teaching aids at the proper time.
7. It stimulates the teacher to find out the method which fits any learning situations.
8. It makes the teacher attempt to follow through to the doing level.

9. It encourages self-analysis and self-evaluation of the teacher.

Essentials of a teaching plan

1. Identification or lesson plan headings such as
    - a) the agricultural enterprise
    - b) the lesson unit or teaching area
    - c) the class
    - d) the time of year to teach
    - e) the estimated number of periods required.
2. Statement of objectives - what the student should learn.
3. The four steps in the teaching process

    For mental abilities:

    - a) preparation
    - b) presentation
    - c) application
    - d) evaluation

    For manipulative skills:

    - a) preparation of the learner
    - b) presentation of the operation

c) the try-out performance, and

d) follow-up.

What might also go in the plan

The above three are essentials, but you may also wish to incluse the following:

1. Teacher preparation items such as arrangements to be made, supplies and aids to be provided and tests to be prepared.
2. References
3. Assignments
4. New subject matter for the teacher's use.

The Four Steps

For mental abilities

1. Preparation (of the learners).
    - a) To motivate and create interest.
    - b) To develop a feeling of need within the student.
    - c) To build on what he already knows.
    - d) To acquaint the student with the purposes of the lesson.

e) To begin to develop ideals and appreciations.

Caution: This is a very important step for the success of the lesson.

2. Presentation (to the learners)

a) To acquaint students with facts and principles.

b) To give understanding.

c) To get him to learn the what, why, how and when of the lesson.

d) To strengthen his interest and feeling of need.

Caution: Too often this is the only teaching step used. The students are only told facts and principles. This is not enough.

3. Application (by the learners)

a) To develop the abilities of each student to apply the facts and principles learned.

b) To correct misunderstandings.

c) To draw conclusions as called for.

Caution: Do not assume that the students can make use of what you have presented in step 2. It is your job to see that they can use it.

4. Evaluation (of the learners)

   a) To test student's knowledge of facts and principles.

   b) To test his ability to apply what he has learned.

   c) To continue to correct any wrong ideas.

Caution: It is well to remember that evaluation of his knowledge may help the student to pass an external examination but it will not really help you evaluate what he can do in later life. You must make sure that he can apply his knowledge.

For manipulative abilities

1. Preparation of the learner.

   a) Get his complete attention.

   b) Place him in correct position to see you demonstrate.

   c) Find out how much he knows about the job.

   d) Explain its importance.

2. Presentation of the operation.

   a) Show (demonstrate), explain and question.

   b) Take one step at a time. Stress key points.

      Go slowly.

   c) Point out safe working habits.

3. Try-out performance.
    a) Have the student perform the job.
    b) Have him explain and show you.
    c) Have him explain key points.
    d) Ask questions and correct errors.
    e) Continue until you know he knows.

4. Follow-up.
    a) Put him on his own.
    b) Advise him what to do in unusual situations.
    c) Check his work to be sure he is doing the job correctly.
    d) After you have made sure he can do the job and explain it clearly, have him demonstrate to another student.

An Example of a Comprehensive Plan

Enterprise:	Poultry.	Time:	July or August
Lesson:	Feeding and Care of Baby Chicks.	Periods:	5
		Class:	IX.

Objectives

1. To develop attitudes and appreciations:
   - a) The desire to brood chicks artifically.
   - b) The acceptance of the fact that it requires skill and care to raise chicks successfully.
   - c) That artificial brooding costs less than natural.
   - d) That losses due to disease can be prevented.

2. To develop abilities:
   - a) When to give first feed and water.
   - b) What feed, and how much to provide.
   - c) When to add green feed and grits (gravel).
   - d) How much heat and ventilation to provide.

3. To develop skills:
    - a) How to teach chicks to eat and drink.
    - b) How to tell if chicks are too hot or too cold.
    - c) How to recognize sick chicks.
    - d) How to provide sanitary conditions for young chicks.
    - e) How to mix and prepare chick food.
    - f) How to adjust and regulate heat.

Teacher Preparation

1. Review available information on raising chicks.
2. Start this lesson two weeks before chicks hatch.
3. Develop short test to cover the lesson.
4. Develop list of references for assignments.
5. Check and have ready the following equipment: Housing, brooders, heat source, thermometer, feed supply, feeders, water and waterers, floor materials and chicks.

Student Preparation

1. Establishment links with previous lesson and motivate
    a) "How long did we decide the chicks could stay in the incubator after they hatched?"
    b) "What should we do with them after removal from the incubator?"
    c) Place statement on board: 'Chicks can only be well raised if they stay with a hen.' Ask, "Is this statement true?" Discuss briefly but it is not necessary to draw a conclusion yet.
2. List student objectives on board-especially the ability list. Announce "These are the jobs each of you will want to get the answers for or learn to do."
3. Make some study assignments.

Presentation

Study assignments. Have them use the list of abilities as objectives to serve as guides. Then have a question and answer session.

Correct answers to be listed finally on the board.

Draw conclusion to statement about brooding chicks with mother hen only.

Demonstrate and explain regulation and control of the brooder.

After chicks are in brooder show boys how to teach chicks to eat and drink.

Application

Check student notes and suggest corrections.

Have a short question contest by spilitting class into two sides.

Ask short objective questions to serve as a review.

Appoint boys in rotation to care for chicks. Have each one learn to handle chicks and to teach them how to eat and drink.

Evaluation

Watch boys at work.

Question individuals to bring out the extent of learning.

Have a short test (placed on the blackboard):

a) How can you find out if chicks are too cold?

b) What do you watch for to determine if chicks are sick or unhealthy?

c) How do you determine the amount of feeder space for chick feeders?

d) Name three good feeds for very young chicks.

Note: This is a complete set of lesson notes. It is flexible and can be changed as you wish. New sources of information can be added under 'teacher preparation'. It identifies all the problems in the form of objectives which must be answered. It may not be just what you would want or made just the way you would do it, but you should be able to get some ideas from it. A lesson plan thought out and written by you will probably be more satisfactory for your use.

An Example of a Plan for Manipulative Skills

Enterprise:	Floriculture	Time:	January
Lesson:	"T" or shield budding of roses.	Periods:	1 - 2
		Class:	XI.

Objectives

1. To get students acquainted with improved techniques of a sexual propagation.
2. To develop in them appreciation of the need for perfection of operations in order that buds will grow.
3. To develop in each student the ability and skill to do a neat, speedy and successful job of budding.

4. To get a 90 per cent bud growth.

Equipment

1. Bud sticks. (Not less than 4 buds per boy).
2. Selected young seedling shrubs. Some in pots.
3. Budding rubbers or rubber bands, wood-lables, pencils.
4. Budding or grafting knives.

Preparation

Link with previous knowledge: "What are some of the words which we used in our study of plant propagation?"

Place such terms on the board as asexual, cambium layer, stock, scion, bud stock, axillary buds, etc.

"One of the ways to propagate asexually is by budding. Have any of you seen it done?"

Announce what you plan to do.

Presentation

Demonstrate using the job breakdown given below.

Calling up one boy demonstrate to him and when he knows how to do it, have him show another boy while you demonstrate to a third boy and so on, until the whole class can do it.

Try out

Check first budding of each boy in so far as possible. Watch cutting process.

Each boy should do only two buds until you have made corrections.

Demonstrate to class again bringing out problems and weak points.

Follow-up

Check for speed and dexterity.

Question on terms and procedures. Have each boy make a final bud graft as a test.

***

Job Breakdown

(To be used by Teacher as he demonstrated)

Important steps (What to do)	Key points
	a. Must be hardwood and dormant.
	b. Before or during winter pruning time.
	c. Stock 1/2" or preferably larger.
	d. Cambium green and fairly loose.

2.	Select bud sticks.	a. Take from 3/8" to 1/2" branches. b. Use current growth. c. Cambium green and fairly loose. d. Have two to four axillary leaf buds on each stick (Scion).
3.	Make "T" out on stock.	a. Razor sharp knife. 2" blade, rounded. b. Cuts to be made 1" to 2" above soil level. c. Horizontal cut 3/8" to 1/2" long. Roll knife. d. Lower vertical cut 1/4" to 1/2" long. Connect with horizontal cut. e. Loosen bark. f. Hand above cuts. Thumb on back of stick. g. Lift bark enough to receive bud. h. Cambium to remain on stick.

4. Remove bud from scion.	a. Short horizontal cuts 3/4" below bud and 1/4" above bud. b. Cut out bud. Start 1/4" above and finish 3/4" below. c. Single clean stroke. Take a little wood. d. Keep thumb under bud stick for safety. e. Retain bud on top of blade.
5. Insert bud.	a. Place bud in "T" cut with long point down. Bud points up. b. Force bud into place. c. Do not touch buds with fingers.
6. Tie bud	a. Use rubber bands. b. Start at bottom and overlap end. c. Wrap below and above bud. d. Bud must remain visible. e. Lift last encircling band above bud and slip end under to tie. f. Do not stretch band too tight.

7. Tag stock

a. Use small wood potting tags with string.

b. List on it variety, name and date.

c. Place just above bud, not too tight.

Enterprise:	Cotton	Time:	Second half of June.
Lesson:	Sowing cotton seed.	Periods:	3
		Class:	X.

Objectives

1. To develop manipulative skills for cotton sowing.
2. To learn to grow cotton on a scientific basis.
3. To compare the yields of different varieties and by different methods.

Teacher Preparation

1. Revision of requirements regarding soil, climate and methods of sowing.
2. Getting the seed and implements ready for use.
3. Arrange for necessary labour after class work.

Preparing Students

1. Previous knowledge expected: soils, varieties, methods of sowing and knowledge of implements.
2. Get answers to the following:
    a. What is the condition of soil required for growing cotton?
    b. What weeding implemtns are used?
    c. What should be the distance between rows?
    d. What is the distance between plants?
    e. How much area can bullocks cover in one day?
    f. What quantity of seed will be sown by use of one pair of bullocks?
    g. How much total seed will be required?
    h. With what medicines will the seed be mixed?

Presentation

1. Demonstrate:
    a. The proper way to handle implements.
    b. The best way to carry seed.
    c. Speed of putting seed.
    d. How to keep lines straight.

   e. How to turn bullocks.

   f. How to keep speed.

   g. Use of safety measures.

2. Go over all the points again by asking questions.

Application

1. Actual sowing by students.
2. Demonstrations by students to other students.

Evaluation

1. Write down information on above points.
2. Evaluate on the following points to chieck whether all points have been thoroughly understood:
   a. Ratio of quantity of seed to quantity recommended.
   b. How to get straight lines.
   c. Ratio of area covered and area which should be covered by the average worker.
   d. Ratio of space between rows compared with space required.
   e. Ratio of depth of seed and depth required.

References

1. Notes prepared from books.
2. Information gathered on recent improvements.

Note:

This plan shows a good deal of thinking. The objectives are not stated in terms of specific learning accomplishments, and should be developed further.

It may be difficult for a person reading the plan to know where preparation of the student and presentation ends and starts, but we must remember this is a guid worked out by a teacher for his use only, and it is no doubt perfectly clear to him. That is all that is necessary.

CHAPTER VIII

EVALUATION

In this handbook you have read many suggestions to help you guid the intellectual progress of the students. Your next step should be to assess and evaluate the students' progress. The educational objectives as discussed in Chapter I should be the basis for this assessment.

The machinery for examining the achievements of the student is an important element of school organization and of teaching methods. The traditional method of measuring the extent to which you have reached your objectives is an examination. Examinations are classified under two headings - external and internal.

At present the external examination is held either by the secondary school board or the university, neither of which has any direct part in the preparation of the pupils. This external body sets the questions and evaluates the answers. This domination of the educational system by examinations has been long recognized and a programme of examination reform is under implementation. In the meanwhile you can improve your methods of assessment by a greater understanding of internal examinations and tests.

Internal Examinations

Internal assessments are excellent supplements to the external examinations and have many values.

Advantages

1. They serve as yard sticks for measuring abilities and achievement. They provide uniform standards for measurement and comparison.
2. The special character-istics of the individual pupil such as his aptitudes, abilities and temperament can be judged.
3. More opportunities are provided for evaluation.
4. More flexibility in the over-all assessment of the student is possible.
5. Assessment is kept up to date. Each student knows where he stands at all times.

Disadvantages

1. The teacher may show prejudice in his assessment.
2. The teacher may be pressed by parents or headmaster.
3. The teacher may hot feel secure in his ability to draw up examinations.

Precuations

1. You must know full the theory and principles of testing methods.
2. You must develop confidence and courage in your testing work.
3. You must not base your marks on the written tests alone, but also on the daily work and conduct of the student.
4. You must use your own judgement on all occasions when giving marks.
5. You should know when and how to make use of the three types of assessment, written, practical and oral.

Suggestions

1. The written test must be supplemented by assessing the student's attendance and general characteristics.
2. The distribution of marks for internal assessment may be somewhat as follows:
    a. 25% marks for attendance
    b. 50% marks on the basis of 7 or 8 tests in the 9th., 10th. and 11th classes.

c. 25% marks for co-curricular activities, attitudes, industry, social behaviour and citizenship.

3. Instead of having one examination at the end of each scholastic year it is advisable to give three tests during the year. This system encourages steady work and measures short term progress. The test marks should be used at the time of promotion. The third terminal examination should be set jointly by you and another subject teacher.

4. When marking papers set a standard in your mind by reading several papers before beginning to mark. The present percentile marking is not an expert judgment, and it is recommended that you classify the candidates into grades A, B, C, D and E.

A students will be the best 5%

B students will be the next 25%

C students will be the middle 40%

D students will be the next lower 25%

E students will be the lowest 5%.

Factors of a Good Test

The following extracts from a seminar committee report from the University of California, U.S.A. may of interest.

"Some Factors of a Good Test

1. It should measure the progress of the group and serve as a guide to the teacher in future lessons.
2. Good tests are stimulating motivating devices.
3. Students receive a sense of accomplishment when they complete a test, and most of them prefer periodic evaluations.
4. Tests are good teaching devices.
5. Tests serve the tie together past and future lessons, and call further attention to the objectives of the course.
6. Care must be taken to correctly build and use tests:
   a. Questions must be within the scope of the class and as objective as possible.
   b. Most students should be able to complete the test in the time allowed otherwise they may have a sense of defeat.
   c. It is most important that the test measures what it intends to measure.

d. Avoid trick or hidden meaning questions or statements.

e. Simple, brief, and definite questions are best.

f. In presenting the test it is best to have a class read it over first to clarify any mistatements or errors.

g. As a general rule all tests should be announced in advance of the test period so students will have an opportunity to prepare themselves. A surprise test may sometimes be used, and it may better measure what a student knows at any particular time. Many students, however, consider these tests an injustice.

h. Tests should never be given unless the teacher intends to grade and return them, and to discuss them with the class.

i. Tests should never be given as time killers.[1]

Objective Type Examinations

Objective tests are those which one correct answer for each item in the test. They become an excellent tool which you can use in internal assessment. Although much care must be taken in the preparation of the objective tests in order to be sure that the answer is really objective, these tests have the advantage of eliminating the teacher's judgment or any prejudice when marking the papers.

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[1] Graduate Committee Report. Davis, California, U.S.A. College of Education, University of California.

There are numerous types of objective tests, but four which are quite generally used and which are excellent for use by the agricultural teacher are;

1. multiple choice
2. true-false
3. completion, and
4. matching.

An explanation including some characertistics of these four will be given here, as well as examples of each.

Multiple choice

In this test the student must identify or recognize the proper answer from among at least four possible answers. He must use judgment, knowledge, and reasoning abilities. Below are the directions to be given to the student, and three examples taken from different lessons in agriculture:

Directions: In each of the following items only one answer of the four given is correct. Underline the correct answer.

1. Which one of the following breeds of dairy cows gives the highest yearly milk yield ?

   a. Sahiwal

   b. Sindhi

   c. Hariana

   d. Kankrej.

2. One of the following things taken into the crop and gizzard of the chicken serves to break up the food and therefore becomes the "teeth of the hen". Which is it?

   a. Meat scraps or insects.

   b. Barley or wheat.

   c. Water or milk.

   d. Grit (gravel or glass)

3. The average yield per acre for irrigated cotton in this state is considered to be

   a. 5 maunds

   b. 15 maunds

c. 10 maunds

d. 22 maunds

(The answers, with the possible exception of no. 3 in some states are in order, (a), (d) and (c).).

Precautions

1. In constructing each item be sure to make each of the possible answers seem reasonable.
2. Have at least four possible answers. Five are better.
3. Be sure your directions to the students are very concise and understandable. It is well to give one item with its correct answer marked to help make the directions clear.

True-false

In this type of objective test you will make only statements and not ask questions. Each statement must either be true or false. Below are some examples from different lessons. The correct answers have been put in parenthesis but would not be on the test paper which you would pass out to the student.

Directions: Each of the following statements is either true or false. Indicate whether it is true or false by putting a cross (X) in the appropriate column at the right of each statement.

		True	False
(From a lesson on soils)			
1.	The initial or basic ingredient of any soil is rock.	(x)	
2.	Humus is decomposing plant and animal matter.	(x)	
3.	Minerals have but little influence on the colour of soil.		(x)
(From a lesson wheat)			
1.	To insure a good wheat stand you should broadcast 5 seers per acre.		(x)
2.	The use of clean wheat is the major need of the farmer who grows this crop.		(x)
3.	Wheat is considered a very important rabi crop in India.	(x)	

(From a lesson on leaves)

		True	False
1.	Stomata are small mouths in the upper surface of leaves to help catch raindrops.		(x)
2.	Photosynthesis takes place in the leaf of a plant.	(x)	
3.	Leaves give off carbon dioxide at night	(x)	

Note these further points regarding true-false objective tests:

1. Approximately half the items in a test should be true and half false.
2. Use such words as 'always', 'never' and 'only' sparingly or not at all. They are too often found in false statements and students may learn to recognize this fact.
3. If statements are lifted from a book, be sure that they are not modified or changed in meaning by statements preceding or following them in the book.
4. This type of test can be very complete in its coverage, and it is easy to correct. It will take much time to construct.

5. In constructing this test be especially sure that your statements say exactly what you mean them to say and cannot be misunderstood by the students. Make statements short and in simple language.
6. Include some quite difficult statements so as to test the able and bright students.

Completion

In this test an essential word is left out and a blank space provided for it which the student must fill in with the proper word. It tests memory but lacks somewhat in assessing the power of reasoning, judgment, and use of knowledge. Below are some examples, with the correct answers given in parenthesis:

Directions : In each of the statements given below a word which completes and makes the statement true has been left out. Fill in this word.

(From a lesson on milk)

1. The fat globules in the milk are known as (butter-fat).
2. 87% of the content of milk is (water).
3. Both whole milk and skimmed milk are high in the mineral (calcium).

(From a lesson plant propagation)

1. When a plant reproduces itself by transfer of male pollen to the female organ we call this (sexual) propagation
2. A new variety of rose may be grown on an old variety by transferring a leaf bud to the stem of the old variety. This operation is known as (budding).
3. We have what is known as (germination) when a seed breaks its coat and the leaf and root start to increase in size.

Comments

1. Completion items or statements are quite easy to construct but you must be sure that there is only one word which will fill the blank.
2. Be careful not to use word in one statement which is the answer or missing word in another.
3. It is recommended that you do not use more than one missing word in each statement.

Matching Tests

This test compels the students to identify the individual items in two groups or lists of words or statements. Terms or phrases making up one list must be matched or identified with a list of explanations or definitions closely related to the first list. An example follows:

> Directions: Each statement in column 2 explains or defines one of the items of column 1. Place in the space provided at the right of column 2 the letter preceding the word or words given column 1 which the statement in column 2 describes.

	Column 1	Column 2	Answers
A.	Climate	1. Living organisms that hinder the growth of cotton plants.	(G)
B.	Crop culture	2. Living organisms that destroy harmful insects	(J)
C.	Cotton boll	3. The process of growing and caring for plants.	(B)
D.	Dibble	4. The science of soil control	( )
E.	Mechanical weeder	5. Plant and animal material in the soil which is used as plant food.	(F)
F.	Organic fertilizer	6. Commercial or prepared plant food.	( )
G.	Pests	7. A small tool used to make holes in the soil for seeds.	(D)
H.	Seedling	8. A small young plant.	(H)

	Column 1	Column 2	Answers
I.	Weeds	9. The general condition of air, moisture, and temperature.	(A)
J.	Wild friends	10. The capsule fruit of the cotton plant.	(C)
		11. Plants which are out of place.	(I)
		12. A machine to remove unwanted weeds.	(E)

Comments:

1. It is desirable to have more statements in column 2 than in column 1.
2. You must be careful that only one of the items from column 1 can be placed in only one of the blanks in column 2.
3. This test calls for good judgment, knowledge and often application of knowledge. It is difficult to construct but is liked by students.
4. A little practice with a class in answering this type of test will be worth while as otherwise some students may become discouraged and confused.

CHAPTER IX

ARE YOU PREPARED ?

Much has so far been said on why and how to prepare lesson plans, what teaching methods to use, and how to evaluate the progress of students. Why not now check yourself to find out if you are trying to make use of what you have read? Study the following assessment prepared as a lesson leaflet by a college of education in the United States of America and evaluate your preparation. You will find it an interesting process and it may help you to answer the question.

Are You Ready to Teach? (1)

1. Have you determined definitely
    a. Why you are teaching this unit? .... _______
    b. What your students should be able to do.......... _______
    when they finish it?
    c. How well should they be able to do it?........... _______
    d. The important facts they need to know?.......... _______
    e. The important skills they need?................. _______
    f. The interests, habits, and appreciations
    you want them to have........................ _______

---

(1) Lesson leaflet. Are you Ready to Teach? San Luis Obispo, California, U.S.A. College of Education, California State Polytechnic College.

2. Have you planned now to introduce this subject?

   How to

   a. Find out what they know about it?............. ________

   b. Get their interest and attention............... ________

   c. Show them the value of this subject........... ________

   d. Get them active-thinking, writing, discussing. ________

3. Have you decided how to present the important facts which they do not know and skills which they do not have?

   How to

   a. Help them find or discover these facts?...... ________

   b. Stress the most important facts?............ ________

   c. Demonstrate the important skills?........... ________

4. Have you planned how you will

   a. Check each student to see whether he has acquired the facts you presented?.................. ________

   b. Give them practice in applying these facts to real situations?.......................... ________

   c. Check each student to see whether he knows the steps and key points in the jobs you demonstrated?.......................... ________

   d. Give them practice enough to acquire the skills you demonstrated................. ________

   e. Check, correct errors and assist them.... ________

5. Have you planned how you will measure

   a. How many students can do what you tried to teach?... ______

   b. How well each student can do it?.................. ______

   c. The important facts they remember.?............... ______

   d. How well, and to what extent they put into practice the knowledge, skill, ability, and attitudes you developed?.................................. ______

6. Have you put your plan in writing..................... ______

7. Have you checked to see whether you have the books, references, and materials needed?.................. ______

8. Have you determined how much time this unit will take?.. ______

CHAPTER X

FACILITIES FOR AGRICULTURAL EDUCATION

The term facilities is desired to convey here only such tools and equipment, buildings and furniture, farm lands and livestock, and teacher aids as are essential for imparting the scientific knowledge and abilities needed in agriculture to the boys on a vocational basis. They constitute a medium through the help of which you can effectively accomplish your teaching objectives. You may secure results even with limited facilities but the possession of necessary minimum equipment would certainly make your job easier and more effective, and learning on the part of the boys more practical, permanent and interesting.

It is a mistake to ask a competent teacher to work without adequate facilities. Terminal education on the secondary level made necessary the acquisition of many abilities for vocational success. This makes the need for adequate modern facilities both in the field and in the classroom imperative. On the following pages you will find such guides as how to make a choice of facilities by the use of criteria or scale of values, types of facilities needed and their source, and steps you should take in getting your stream or department well equipped. A list of facilities generally considered essential to a complete and well-developed stream of secondary school agriculture is also given towards the end of the chapter.

Criteria for the selection of facilities

Criteria are the basis for good judgment and serve as the basis for those in authority to approve the purchase of the facilities which you need. There must be a reason and justification for each item used in your stream. The criteria suggested below may constitute reasons for or against the acquisition of any piece of farm or classroom equipment. They are the scale of points on which the teacher can make a decision. Study the following criteria carefullybefore applying them:

1. Is the item necessary in order to carry out the demands of the syllabus?
2. Is it necessary to help students the objectives of occupational competency?
3. Is it within the financial means of the school budget?
4. Is it true to life, that is, is it used or should it be used by the farmers of the community?
5. Is it readily available?
6. Will its frequency of use justify its expense?

For example, the syllabus calls for shearing of sheep as a practical activity. There are only a few sheep in the community. Should you buy an electric outfit or a pair of hand shears? Make your decision by the use of the criteria No. 1 indicates a yes for the hand shears and perhaps for the electric outfit; no 2 would be a 'no' for the electric outfit and a partial or doubtful yes for the hand shears; no. 3 is no for the electric outfit and yes for the hand shears; no. 4 is certainly a no for the electric outfit and probably yes to a limited extent, for the hand shears; no. 5 a no for the one and a yes for the cheaper shears; and no. 6 will be no for both. It is doubtful if even sheep shears can be considered an essential item for the stream, although it may be possible to justify the hand shears.

Types and Sources of Agricultural Facilities

To acquaint you with the general nature and classification of facilities and to suggest who is responsible for purchase decisions, this section is given as you may need it. The following is a generally used classification:

1. Farm facilities and equipment.
2. Laboratory facilities.
3. Workshop facilities.
4. Classroom facilities.
5. Library facilities.
6. Audio-visual aids.
7. Staff facilities and needs.

These facilities may be provided from four different sources according to the persons or authorities responsible:

1. Those to be provided by the school management such as land and buildings.
2. Those that are to be provided by the government in the form of grants-in-aid. The government may also specify and provide items listed in the first item above.
3. Those facilities that can be arranged for or produced by the agricultural teacher himself.
4. Facilities that are to be produced by the students as a by-product of their class work or as a co-curricular activity.

For the first two types you should make every effort to prepare justifiable lists of needs and to make forceful recommendations. There is much you can do to insure their acquisition if use tact, initiative and good planning. You are directly responsible for the last two and it should be helpful if you can prepare a list of such articles that can and should be prepared by you and your classes. In this list you might include charts, models, preserved specimens, soils, weeds, seeds and fertilizers.

SUGGESTED LIST OF FACILITIES

These lists are to be considered as the minimum amount of "working tools" for the teacher of agricultural education in secondary schools. In almost all the states of India, State Departments of Education and Boards of Secondary Education insist that there should be a minimum amount of facilities available for the teaching of a subject before they grant permission to start a particular stream in a secondary school. There may still be need for others or for increased quantities of some of the items. In almost all cases the criteria suggested above will be a good guide.

I FARM FACILITIES

a. Farm Equipment

1. Wooden plough (indiginous type)
2. Victoria plough
3. Spring tooth barrow
4. Planet junior cultivator
5. Ridge maker
6. Seed drill
7. Winnower
8. Pickaxe
9. Crow bar
10. Shovels
11. Spades

    12. Hand hoes
    13. Sickles
    14. Rakes
    15. Chaff cutter
    16. Bullock cart

b. Irrigation Equipment

    1. Swing basket or pikota
    2. Persian wheel or mot
    3. Oil or electric pump

c. Plant Equipment

    1. Duster (rotary)
    2. Sprayers

d. Meterological Equipment

    (Already available for Science)

e. Live Stock

    1. Pair of bullocks
    2. Milch cows
    3. Buffaloes
    4. Goats or sheep
    5. Cocks and hens

f. Farm building and land

1. A farm land of at least 10 acres
2. Barbed wire fencing
3. Storage buildings for seed, fertilizers, implements, etc.
4. Staff quarters
5. Servants' quarters
6. Animal shed.

g. Garden implements

1. Pruning shears
2. Grafting knives
3. Budding knives
4. Translanting troels
5. Pruning saw
6. Sacateurs
7. Wheel barrow
8. Water sprinklers

h. Animal husbandry and dairy equipment

1. Branding notching, and dehorning set
2. Irrigators, drenching bottles.
3. Instrument box
4. Medicine chest
5. Castrator
6. Curry combs, brushes, halters, floor squeegees

7. Cream separator
8. Butter churns and accessories
9. Milk bottles, bottle caps, capping machine.

i. Poultry equipment

1. Egg tester
2. Egg weighing balance
3. Brooders
4. Incubator
5. Automatic waterers
6. Wire netting, trapnest, feeding troughs, perches, baskets, egg-cases and disinfectants.

j. Apiary equipment

1. Hives (fuunndation hives, super and combs)
2. Smoker
3. Hat and veil (metting)
4. Stripping knives
5. Drine trap, queen's cage

II LABORATORY FACILITIES

a. Soil testing equipment

1. Soil auger
2. Soil sampling tube
3. Soil testing outft

4. Density bottle, sieves, test tubes, pipettes, burrets
5. Microscopes

b. Fruit preservation equipment

1. Sterlizers
2. Thermometers
3. Bottling machine
4. Stoves and utensils
5. Fruit slisers, glass jars, jelly bag

c. Milk testing Equipment

1. Lactometer
2. Garbers' centrifuge
3. Small pasteurizer and cooler

It is expected that a laborary cum classroom of a adequate size (about 30'x30') has been provided with necessary shelves working tables, reagents, gas or spirit lamps and glass equipment such as beakers, tubings and flasks.

III WORKSHOP FACILITIES

There should be a working shed big enough to provide facilities for 20-25 boys at a time. There should be work benches and the following minimum equipment

1. Forge
2. Anvil
3. Blow torch

4. Tin snips
5. Hand-turned grind stone
6. Whet stones
7. Set of carpentry tools
8. Set of metal working tools
9. First aid equipment
10. Iron vises
11. Wood vises

IV CLASSROOM FACILITIES

An agriculture cum laboratory room of at least 30' x 30' should be provided. It should have student desks and class, a teachers' table of such size as may allow deminstrations, a black board, and a roll-up screen for projection purposes. The room should be well ventilated and well lighted and should also be well decorated by appropriate illustrative materials such as charts, diagrams, pictures and models.

V AUDIO VISUAL INSTRUCTIONAL AIDS

There are many varieties of such aids and while some may have to be purchased, others can be improvised. Not all visual aids have sufficient educational value to justify their acquisition. You should determine with the help of criteria whether to acquire and use a particular aid under a specific situation. The lists given below are therefore only suggestive:

a. Cinemas: These can be borrowed or rented from organisations dealing with such matters. Your district educational authorities can give you guidance on this. Some such organisations are however mentioned here.

Film library of the Ministry of Education, Government of India

State film libraries

District information centres

TCM, New Delhi

USIS and information departments of overseas

Missions and embassies in India.

b. Projection equipment

Projector with accessories

Epidiascope

Convertor (if necessary)

Screen

c. Film Strips : You can build up a small library of film strips by purchasing suitable film strips from various commercial agencies, or from organizations listed above.

d. Slides: If you are interested in photography you can prepare your own slides or you can buy them. Usually they are small transparenties which can be projected by the film strip projector.

e. Photographs: (Enlarged and mounted) especiall those taken in the local community.

6. To provide and encourage the development of organized rural recreational activities.
7. To discover and utilize opportunities for boys to gain employment in agricultural pursuits.
8. To learn about public services available to farmers in the community and how to gain benefit from these services.
9. To develop abilities in producing, marketing and utilizing farm products.
10. To encourage participation in worthy undertakings for the improvement of agriculture.

Activities for the F.F.I.

Only a few activities will be suggested here. A teacher with imagination and a live group of students will think of many others.

1. Leadership activities

    Public speaking

    Conducting meetings and debates

    Attending conferences and visiting other clubs

2. Scholarship activities

    Assisting junior members to get better results in school

    Inviting outside experts to speak to classes and meetings

    Preparation of charts and models and collection of exhibits for the classroom.

f. Preserved and mounted specimens:

   1. Collections of insects and pests
   2. Collections of weeds
   3. Collections of plant diseases.

g. Farm products and equipment:

   1. Collections of different kinds of soils
   2. Collection of different varieties of seeds
   3. Collection of different kinds of fertilizers.

h. Charts, graphs and maps are valuable teaching aids specially in charting results obtained in farming programmes.

Such charts can either be prepared by you and your students or mounted commercial charts can be purchased from the market. Maps are usually to be purchased. Most charts have to be exhibited only while they are being used and should be folded or rolled and kept carefully thereafter.

i. Models and Exhibits of various kinds

j. Booths and display: Can be temporarily arranged on appropriate occasions especially when parents and guardians came to school on annual days.

k. Field trips and tours: Are very important if funds permit, The boys can go to

   1. Government research station,
   2. Agricultural colleges,
   3. Agricultural exhibitions and shows,

4. Fields of nearby communities,
5. Local and city markets,
6. Dairy farms, fruit preservation factories, and
7. Bee-keeping Centres and poultry farms.

V STAFF FACILITIES

In a well developed stream with at least 30 boysin each of the three years, it is essential to have the necessary staff to look after and be responsible for various jobs. It has to be your responsibility however to guide, coordinate and supervise the duties of all the staff working in your stream. The following minimum staff is suggested:

1. One senior agricultural teacher
2. Two junior agriculture teachers
3. Two field or live stock labourers.

The above staff will be required if you have got a maintenance workshop, a laborary, and a farm of at least 10 acreas. You may modefy the staff according to your requirements.

RECOMMENDED REFERENCES

Agricultural Education

1. HAMLIN, HERBERT H., Agricultural Education in Community Schools. Danville, Illinois. The Interstate Printers. 1950.
2. PHIPPS, LLOYD I., Handbook for Teachers of Vocational Agriculture. Danville, Illinois. The Interstate Printers. 1956.
3. GARRIS, E.W., Teaching Vocational Agriculture. New York. McGraw-Hill Book Co. 1950.
4. HAMMONDS, CARSIE., Teaching Agriculture, New York, McGraw-Hill Book Co., 1950.
5. TENNEY, A. WEB, Practical Activities for Future Farmers., Danville, Illinois, Interstate Printers. 1954.
6. TENNEY, A WEBSTER, Programmes for F.F.A. Meetings. Danville. Interstate Printers. 1938.
7. Collecting and Preserving Specimens for Use in Teaching Agriculture. East Lansing. College of Education, Michigan State University.
8. Nasco Catalogue. Latest edition. Supplies for agriculture. Fort Atkinson, Wisconsin. National Agriculture Supply Co.
9. Official Manual for F.F.A. Alexandria, Virginia. Future Farmers Supply Service. Latest edition.

General Education

1. DALE, EDGAR, Audio Visual Aids in Education. New York. McGraw Hill Book Co.
2. KURCH, R. RANDOLPH, ESTABROOKE, EDWARD C., 250 Teaching Techniques. MILWAUKEE, WISCONSIN. The Gruce Publishing Co. 1956.
3. LANCELOT, W.H., Permanent Learning. London, John Wylie and Sons. 1950.
4. ROBERTS, H.H., Rules of Order. Chicago, Illinois. Scott, Forseman and Co. 1943.

Crops and Vegetables

1. AYER, A.K. AND Y.N. Field Crops of India. Bangalor. Bangalore Press. ______.
2. CARDOZIER, V.R. Growing Cotton. New York. McGraw Hill Book Co. 1957.
3. DOUGHERTY, PAUL, How to Grow Field Crops in California. Dubuque, Lowa. W.C. Brown Co. 1955.
4. MUKERJI, N.G., Handbook of Indian Agriculture. Calcutta. Thacker Spink and Co.,

5. The Peanit-the Unpredictable Legume. Washington, D.C. National Fertilizer Association. 1951.

Horticulture

1. DAVIS, Horticultural Enterprises. Chicago, Illinois. J.B. Lippincott and Co.

2. HAYES, W.B., Fruit Growing in India. Allahabad Kitabistan.

3. KAINS M.S. AND MC QUESTION P.M. Propogation of Plants. New York.

Soils

1. DONAHUE, FRANK, Our Soils and Their Management. Danville, Illinois. Interstate Printers. 1955.

2. WEIR, W.W. Productive Soils. Chicago, Illinois. J.B. Lippincott Co. 1946.

3. WORTHEN, EDMUND L, AND ALDRICH, SAMUEL R., Farms Soils, their Fertilization and Management. New York, John Wylie and Sons. 1956.

Animal Husbandry and Dairying

1. BUNDY C.E. AND DIGGINS, R.V., Livestock and Poultry Production. San Francisco. Prentice Hall Inc. 1954.

2. BUNDY C. E. AND DIGGINS, R. V. Dairy Production. San Francisco, Prentice Hall Inc. 1955.

3. HORLACHER, LEVI J. AND HAMMONDS, Carsie Sheep . Danville, Illinois, Interstate Printers. 1953.

4. AYER, A.K., Dairy Farming in India. Bangalore Press.

5. COOK, GLEN AND JUERGENSON, Choord. Approved Practices in Poultry Production. Danville, Illinois. Interstate Printers. 1955.

6. DYKSTRA, Animal Sanitation and Disease Control. Danville, Illinois, Interstate Printers. 1955.

7. MORRISON, HENRY, Feeds and Feeding. Ithaca, N.Y. The Morrison Publishing Co. 1958.

8. Animal Diseases, Year Book of Agriculture. Washington, D.E. U.S. Department of Agriculture. 1956.

Apiculture

1. DADANT, First Lessons in Bee Keeping. Hamilton, Illinois. Dadant Publishers.

2. ROOT, A.I., ABC and XYZ of Bee Culture. Medina, Ohio I.A. Root Co. 1950.

Farm Mechanics

1. COOK, GLEN C, AND PHIPPS, LLOYD J., 600 Things to Make. Davinville, Illinois, Interstate Printers, 1952.

2. JONES, MACK M., Farm Shop Practices. New York. McGraw Hill Book Co. 1940.

Plant Pests

1. METCALF AND FLINT. Destructive and Useful Insects. New York, The McGraw Hill Book Co., 1951.

2. PEAIRS, L.M. AND DAVIDSON, R.H., Insect Pests of Farm Garden and Orchard. New York. John Wylie and Sons. Inc. 1954.

Farm Management

1. HALL, AND MORRENSEN, Farm Management Handbook. Danville, Illinois. Interstate Printers. 1927.

2. HOPKINS AND MURRY. Elements of Farm Management. San Francisco., Prentice Hall Inc. 1953.

3. HAMELTON, JAMES E, AND BAYONT, W.R. Profitable Farm Management. Edgwood Cliffs, New Jersy, Prentice Hall Inc.

CHAPTER XI

CO-CURRICULAR ACTIVITIES

If you believe in the objectives of agricultural education, and if you believe farmers as well as government clerks and doctors need an education for their life's work, then it is your duty to give to your students the extra well-rounded education that will make them good citizens of their communities and leaders among their people. This can best be done through co-curricular activities. Since you do not have enough time during class periods to handle this type of work and have to use out of school hours, such activities must be well organized in order to utilize your time properly and to make the activities successful.

You should conscientiously consider starting an association or club for your agricultural students. Such a club may well be called the Future Farmers of India.

The following pages have been written to help you start the Future Farmer Club together with some suggestions on how it can function.

Procedure for Organizing the Club

1. Discuss your intentions with the headmaster to get his approval. Study the purposes, activities and constitution as given on the following pages and work out your plans for the conduct of the club before you go to him.

2. Discuss the new proposal with a few of the leaders from among the agricultural students and gain their cooperation.

3. Guide these leaders in suggesting and developing

    a. the purposes of the club

    b. a constitution and by-laws

    c. and how to conduct meetings.

4. Hold a first meeting with all agricultural students so they may understand what it is all about and will be anxious to go ahead with this activity.

Purposes of the Future Farmers of India[1]

These purposes have been suggested and have been the controlling incentives for such clubs in many places:

1. To create and nurture a love of rural life.
2. To strengthen the confidence of the student in himself and in his work.
3. To encourage the members to improve the farm home and its surroundings.
4. To encourage improvement in scholarship.
5. To encourage the practice of thrift.

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[1] Adaptation: Official manual for future farmer of America, Alexandria, Verginia, Future farmers supply, service 1955, p. 10.

Going on a club picnic or excursion.

Organizing indoor games.

7. Earning and saving activities

Establish a thrift bank for members.

Maintaining a proper system of accounts for the club.

Organizing 'fund raising campaigns' for the club.

Establish a nursery for raising and selling seedlings and plants to the community people.

8. Information and promotion activities

Maintenance of a bulletin or news board.

Publishing a news letter or club bulletin.

Subscribing too agricultural magazines.

Parents day for parents of agricultural students.

Eighth grade day for boys just ready to pass out of the eighth standard.

Preparing an agricultural stream exhibition.

Preparing a 'progress' board for the school farm.

Inviting farmers and important citizens to visit the farm and classes.

Constitution and by-laws

You will find below a suggested constitution and by-laws for your club. The constitution and by-laws are nothing more nor less than rules and regulations set up to guide your club in its organization and its conduct.

The material given here although valuable as suggestions will probably need to be modified to fit local ideas and needs. Develop your own constitution and by-laws so they will function for you.

Those items which follow have been adapted from similar constitutions and by-laws of organizations in America. Reference may be made to them.[1]

Constitution

Article 1. Name and purposes

Section A. Name

The name of the club shall be ______________________________.

It is an organization of and by students participating in a programme of organized instruction in agriculture of the higher secondary grade, under the provisions of the curriculum of the ________________________ school, and of the rules prescribed by the state government regulating such organizations. It is non-profit and non-political and is made up of voluntary membership.

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[1] Phipps, Lloyd J, Handbook on Teaching Vocational Agriculture, 1956. Dawille, Illinois, Interstate Publishing Co., pp. 547-551 and pp. 950-956.

Section B. Primary purpose.

The primary purpose of the club is to develop leadership, cooperation and citizenship, and to promote the agricultural welfare of the community and state.

Section C. Contributing purposes.

(Refer back to previous section on purposes in this chapter.)

Article II. Organisation

Section A.

The ____________________ club of the FFI is an organization of boys receiving instruction in the agricultural stream in an institution recognized by the state. The recommended age range is __________ to _________ years.

Section B.

The ____________________ club shall exist only during the time fixed by the local school administration, and the constitution by-laws, and activities must be acceptable to them.

Section C.

The local teacher of agriculture shall be the advisory of the local club.

Section D.

The financial year of the club shall be __________ to ____________.

Article III. Membership

Section A.

All the boys who are studying in the agricultural stream are eligible to become members, and membership shall be voluntary.

Section B.

The membership shall be of two types, (a) active, and (b) honorary. There shall be two grades of active members (a) the first grade Future Farmers, and (b) the second grade Future Farmers. The honorary membership can be confered by a majority vote upon such persons as supervisors, farmers, school administrators, agricultural teachers, and others who have helped to advance agricultural education and the F.F.I.

Section C.

All active members shall pay an annual subscription fixed by the local club.

Section D.

An active member will automatically lose membership if

1. he fails to attend ______ successive meeting without a valid excuse
2. he fails to attend more than ________% of the meetings during the year
3. his annual dues are in arrears for more than ____months.

Article IV. Officers

Section A.

The officers shall be president, vice-president, secretary, treasurer, reporter, and local advisor. With the exception of the advisory, the officers will be active members of the club and shall be elected annually by a majority vote of the members. The elected officers together with the local advisor shall constitute the executive committee.

Article V. Meetings

Meetings of the club shall be held once each month throughout the year. Special meetings may be called by the executive committee at any time.

Section B.

Meetings will be conducted by parliamentary procedure in accordance with accepted rules of order.

Section C.

The order if business at regular meetings shall be call to order

roll call
reading of the previous minutes
report of committees and officers
unfinished business
new business
special events, and
adjournment.

Article VI. Dues and Funds

Section A.

Annual membership dues shall be fixed by the executive committee subject to the approval of a two-thirds vote of the members. These dues are to be fixed at a minimum rate necessary to the proper functioning and conduct of the club.

Section B.

Funds of the organization shall be handled in the same way as the school handles the funds and accounts of other student organizations.

Article VII. Emblem and colors

Section A.

The emblem of the ___________ club of the F.F.I shall be

____

The colours of the ___________ club shall be _________________________

Article VIII. By-laws

Section A.

By-laws, amendments, and rules temporary or semi-permanent in nature shall be adopted by the club on previous recommendation of the executive committee and by a two-thirds majority vote of the members.

Section B.

The duties of officer should be prescribed in the by-laws to be in harmony with such duties as they normally are practiced.

Section C.

The president of the club should appoint the following standing committees annually.

Nominating committee

Programme committee

Budget and audit committee

Scholarship committee

Section D.

Election of officers. The rules of election shall be framed by the local club in keeping with accepted practices.

GLOSSARY

A

Animal husbandry	Animal science. In common usage it includes not only livestock such as dairy and sheep, but poultry as well.
Application	The third step the teacher should use in a lesson. In this step the student begins to apply and make use of the knowledge and skills given in the presentation step.
Assessment	A measurement of the extent to which the student has attained the objective of the lesson.
Assignment	A study or activity to be done by the student, usually in preparation of his lesson.
Audio-visual aids	Teaching aids, or instructional materials which can be seen and/or heard by the student.

B

Behaviour	Student action and responses.
Breakdown	Referred to in this handbook as a detailed analysis of a lesson or an operation.

Dynamic	Having potentiality for further action.

E

Enterprise	The different crops and livestock such as paddy, sheep, pulse, and poultry, which produce farm products or service.
Evaluation	The testing of, or assessment of a student to determine what he has learned, or what changes of behaviour have occured.

F

Facilities	Equipment, buildings, instructional material and land needed to effectively conduct the operations of the stream.
FFI	Future Farmers of India. A youth organization of students of agriculture in the secondary school under the authority of the school.
Follow-up	This is a part of the application and evaluation steps of a lesson which calls for further mental or manual practice.

I

Implication	A suggested meaning but one not expressed. To signify; to involve; or to imply certain results, procedures, problems, or limitations.

Instructional materials	Teacher aids. Any facility or device he uses to assist him in his teaching.
Integration	An essential part of a whole. For instance the agricultural teacher insists on good language composition in the note books of the students. In this case, good language is integrated with the agriculture lesson.

J

Job	A specific operation of a farm enterprise. Grading eggs is a job in poultry; and feeding fodder to the dairy cow is a job in dairying.
Job analysis	Refers to the analysis of an enterprise into its detailed jobs.
Job breakdown	An outline of steps and key points used by the teacher as he demonstrates a manipulative skills.

L

Lesson plan	The teacher's notes which serve as his guides for preparation and procedures for teaching lesson.
Long-time plan	A complete and detailed plan of procedures for conducting the agricultural stream over a period of three to five years.

M

Manipulative skill	A skill involving manual use of the body to achieve the end aimed at. Making a clove hitch is a manual skill used in agriculture.
Method	A planned system of action and conduct used by a teacher.
Motivation	The promotion of interest or the arousing of interest in the student. It develops the feeling of need for the lesson in the student.

N

Non-enterprise	A major teaching area which is not specifically related to only one single farm enterprise and may relate to a number of enterprises and is taught as a separate subject.
Non-vocational	This refers to a general education which may give board training in knowledges and appreciations of an occupation, but which does not have as its objective a training to the doing level or occupational competency.

O

Objective test	Often spoken of as a short answer test, each statement or question in such a test calls for only one correct answer.

Occupational competency	The degree of learning or training which gives such proficiency in an occupation (in this case farming) that the learner can successfully carry out the demands of the occupation.

P

Preparation	The first step in teaching any lesson. It is the mental preparation of the student his motivation.
Presentation	The second step in any lesson. The information knowledge and skills necessary for the student to meet the objectives of the lesson that are presented to him.
Profile	An outline. In this handbook it is used in the unusual manner as to mean the outline of characteristics of a teacher.
Project method	A method of teaching wherein the teacher has the student carry on the actual form enterprise, or a large proportion of it, under netural conditions.

R

Rating scale	A set of criteria, each item of which is rated with a numerical value.

T

Teaching area	In agriculture it refers to a group of related jobs falling under one enterprise. Breeds of dairy cattle, control of cotton diseases, and facilities for bee-keeping, are three job groups or teaching areas.
Technique	A skill used in handling a teaching method.
Teaching situation	Environmental or other conditions in which the teaching takes place. It may be made up of many factors.
Terminal	The end or finish of formal education. The secondary terminal student does not go on to college.
Test	An examination. Usually it refers to a short examination.

V

Visitation	A programme of visits. In vocational agriculture it refers to the visits made by the teacher to supervise the project of the student, or to consult with parents and student.
Vocational	A type of teaching or training which aims at a 'learning to do' level. Training to occupational competency.

BIBLIOGRAPHY

Books

1. BENT, R.K. AND KRONENBERG, H.H. Principles of Secondary Education. New York, McGraw Hill Book Co., 1955.

2. CASWELL, HOLLIS H.AND OTHERS. The American High School, New York, Harper and Bros. 1946.

3. DOUGLASS, H.R. The High School Curriculum. New York, Ronald Press Co., 1947.

4. SCRUBER, F.C. AND BEATTY, T.B. Secondary School Activities. New York, McGraw Hill Book. 1959.

5. HAMLIN, HERBERT M. Agricultural Education in Community Schools. Danville, Illinois. Interstate Publishing Co. 1950.

6. HAMMONDS, CARSIE. Teaching Agriculture. New York, McGraw Hill Book. 1950.

7. NAVARATNAM, RATNA New Frontiers in East-West Philosophies of Education. London, Orient-Longmans Co. 1958.

8. PHIPPS, LLOYD J AND COOK, GLEN C. Handbook on Teaching Vocational Agriculture. Danville, Illinois. The Interstate Publishers. 1956.

9. Report of the Secondary Education Commission, June, Ministry of Education, Government of India, New Delhi, 1953.

10. STRUCK, F.T. Creative Teaching. New York, John Wylie and Sons. 1956.

11. WALL, STANLEY, A more Effective F.F.A. Danville, Illinois. The Interstate Publishing Co. 1956.

Miscellaneous

1. Collecting and Preserving Specimens for use in Teaching Agriculture. State of Michigan. College of Education, East Lansing, Michingan.

2. Future Farmer Facts. State of California. California Association of Future Farmers, State College, San Luis Obispo.

3. Housing and Equipment for Agricultural Education. State of California. Bureau of Agricultural Education. Sacramento, California State Printers. 1959.

4. FLETCHER, FRANK M. Internal Assessment Manuscript, State of Ohio, College of Education, Ohio State University, Columbus, Ohio. 1960.

5. I've Found my Future in Agriculture. Bulletin. American Association of Land Grant Colleges and State Universities. 1950.

6. Laboratory Supplies and Equipment for Vocational Agriculture. Bulletin. State of Ohio, Department of Education, Ohio State University, Columbus, Ohio. 1954.

7. LESSON LEAFLETS. State of California. San Luis Obispo, California State Polytechnic College.

8. LESSON LEAFLETS. State of California. Davis, College of Education, University of California.

9. NASCO CATALOGUE. Agricultural Supplies. Fort Atkinson, Wisconsin. 1959 Edition.

10. BULLETIN, Reference Books for Departments of Vocational Agriculture. State of Ohio, Department of Education. Ohio State University, Columbus, 1950.

11. Teachers' Manuscripts. Long-time Plans. Government of India, Seminar of Agricultural Teachers, Simla, India.

12. BULLETING. The Method Demonstration. Indian-American Technical Cooperation Programme. Faridkot House, New Delhi, 1958.

13. BULLETIN, This is Your Life-Teaching Vocational Agriculture, Columbus State of Ohio, Department of Education, Ohio State University, 1950.

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